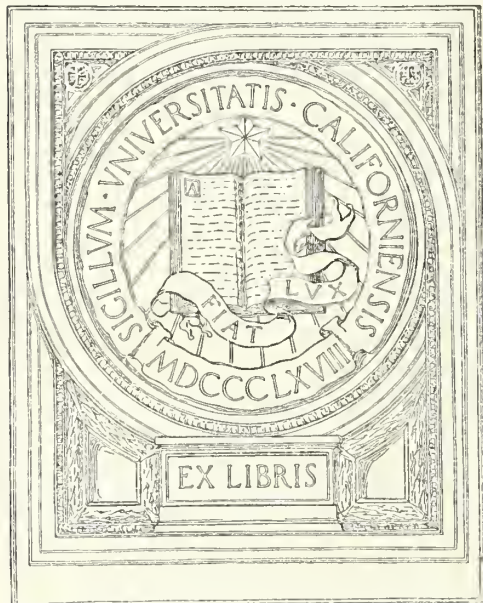


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No. 1

SYMPOSIUM ON BIOPSY PROCEDURE IN CANCER AND PRECANCEROUS LESIONS

BIOPSY IN OTOLARYNGOLOGY*

GEORGE J. TAQUINO, M. D.†
NEW ORLEANS

Everything that can be said concerning biopsy in other fields can also be said concerning its use in otolaryngology. By the use of biopsy we come nearer to distinguishing with absolute accuracy between benign and malignant disease than with any other diagnostic aid we possess. It thus guarantees that no patient shall be submitted unnecessarily to surgery, which must always be radical, and which frequently is potentially lethal. Finally, biopsy is most useful, and the percentage of curability is highest, when it is used not to substantiate a clinically established fact but to confirm or exclude the mere suspicion that malignant disease exists.

These are generally applicable principles. There are, in addition, certain considerations particularly applicable to biopsy in otolaryngology which I shall present briefly by the question and answer method.

When should biopsy be performed in otolaryngology? The answer is categorical: Whenever the smallest doubt arises as to the nature of the tissue in a given area, particularly if the tissue is neoplastic; and whenever such symptoms as hoarseness, a persistent cough, dysphagia, or other symp-

toms and signs referable to the ear, nose and throat cannot be promptly and fully explained on the basis of a non-malignant disease process.

Where should biopsy be performed? The answer is, always in the hospital. The average physician does not have in his office all the necessary equipment for biopsy. If he does have the equipment, he does not have the means or the personnel to protect the patient in the event of hemorrhage or other untoward events. It should never be forgotten that bronchoscopy, esophagoscopy, and even laryngoscopy are serious procedures, employment of which while it should not be, has been attended with grave complications, some of which have terminated fatally.

What anesthesia is required? Biopsy of tissue in the ear, nose, throat, and bronchi requires only topical applications of cocaine, pontocaine, or some similar agent. It is essential that the patient be free from discomfort, but inhalation anesthesia is not necessarily desirable.

What points of technic are important? Several considerations should be borne in mind: (1) Appropriate instruments must be used, including, in addition to endoscopic equipment, snares, punch forceps and biting forceps. Dissection of the specimen is not required but electrocauterization of the area later is useful. (2) Biopsy must be done under absolutely sterile conditions and with careful hemostasis. (3) The specimen must be removed under full vision, to be certain that it is properly selected and to be certain also that important structures are not harmed by blind manipulations.

†From the Division of Otolaryngology of the School of Medicine of Louisiana State University.

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(4) Special technics are useful in special areas. If bronchoscopy, for instance, reveals apparently normal tissue throughout the field of vision, scraping (so-called scalping) of the mucosa will provide sufficient tissue for cytologic diagnosis. I have myself distinguished between tuberculosis with negative sputum, and malignancy, in at least four cases by this method. (5) Whenever the suspected tissue is small, the area should be removed in toto. It is perfectly possible in such conditions as granuloma of the vocal cords, for instance, to perform biopsy and eradicate the lesion at the same time.

How shall the specimen be preserved? The otolaryngologic specimen is always small and must be handled with particular care. It should be kept moist, in saline or some other solution, and it should be examined as promptly as possible, especially if it consists only of scrapings. Specimens which must be examined in distant laboratories should be in 5 or 10 per cent formalin solution, packed in special containers, and sent air mail special delivery.

How should a negative report be evaluated? It should not be accepted as final unless it accords with the clinical course. If suspicion still exists, the biopsy should be repeated one or more times, and such a procedure as exploratory thoracotomy is fully warranted if such a condition as carcinoma of the lung cannot otherwise be excluded.

How far should one be guided by the pathologist? If he is competent—and the otolaryngologist should deal with no other kind—his advice should be accepted absolutely. It may be a truism, but it is everlastingly true, that the more experienced the physician, the less does he need the pathologist and the more is he likely to use him. The otolaryngologist is on firm ground when he bases his therapeutic course on a competent pathologist's interpretation of an adequate specimen of tissue secured by biopsy.

BIOPSY IN GASTROINTESTINAL PRACTICE*

GORDON MCHARDY, M. D.†

AND

DONOVAN C. BROWNE, M. D.†
NEW ORLEANS

The field of gastroenterology, in our opinion, encompasses those diagnostic procedures essential to the detailed study of the digestive tract extending from the cricopharyngeal portion of the esophagus to the anus. This broad inclusion may seem an encroachment to some specialists: the bronchoesophagologist may consider esophagoscopy his procedure; the surgeon may conclude peritoneoscopy is in his realm; the proctologist often considers himself diagnostician as well as operator.

The invasion of gastroenterologists into endoscopy and biopsy, however, arose from seeming reluctance on the part of the specialists mentioned to aid in rendering a conclusive biopsy diagnosis. By biopsy, of course, we are presuming the inclusion of cytologic study of material obtained by such simple measures as gastric and small bowel aspiration and paracentesis, as well as thorough endoscopic aids. Just how much the more recent cytologic stains add to the previous staining methods awaits evaluation.

With sincere reservation we select our cases for esophagoscopy, practice meticulous delicacy in instrumentation, but find it simpler to omit an attempt at sterile technic and hospitalization for the performance of routine esophagoscopy. A skilled esophagoscopist with capable assistance can adopt esophagoscopy to office usage just as well as gastroscopy and proctosigmoidoscopy. Our experience in the Touro Clinic, where we are forced to esophagoscope our negro patients, since no hospital service is available to them, substantiates this statement. As a conclusive

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differential study as to the cause of dysphagia, when supplemented by biopsy, it has given unsurpassed assistance. It must be understood that normal mucosa is not biopsied. We do not use a sharp biting biopsy forcep but prefer a blunt cupped (ball-bearing) forcep which merely picks up a piece of tissue. Biopsies should not exceed mucosal depth. We advocate placing a small piece of fibrin-foam to the biopsy site to seal it and stop bleeding. The ambulatory patient leaves after an hour's rest, which permits recovery from pontocaine anesthesia.

Hepatic needle biopsy is gaining acceptance. Tripoli and Fader introduced the procedure to New Orleans in 1941. W. D. Davis gave an excellent review of the progress in this field together with his personal observation in 128 instances at the April 14, 1947 meeting of this Society. Davis, among others, is an advocate of the Roth-Turkel needle; our preference is an elongated Vim-Silverman needle. We still adhere to the adjunctive use of peritoneoscopy to visualize the site of biopsy. With peritoneoscopy, proper preparation, use of a Vim-Silverman needle, subcostal approach and the post biopsy injection of fibrin-foam, we feel that accuracy approaches 96 per cent and the danger is minimal. Our experience with this method is illustrated by the following chart on 50 peritoneoscopic hepatic studies:

Primary Hepatoma	2
Metastatic Carcinoma	12
Melanosarcoma	1
Hemangioma	1
Suppurative Hepatitis (abscess)	1
Hemochromatosis	1
Acute Infectious Hepatitis	4
Fatty Liver	10
Chronic Hepatitis (Cirrhosis)	12
Normal Liver	6

50

Unfortunately neither alone, nor with peritoneoscopy is the procedure adaptable to office routine. It is beyond our hope that even with improved technic and reassurance from satisfactory coagulation that it

will ever be safe for ambulatory patients to be so studied. While many authors claim diagnostic valuation to extremes it is our belief that peritoneoscopy can only give accurate information on the liver, peritoneum, omentum, and on the exposed visceral surfaces easily visualized. One must recognize definite limitations for this examination.

CONCLUSION

Herewith is further support for biopsy. Gastroenterologists are firmly entrenched in a stand for biopsy diagnosis; their field lends itself well to such conclusive study.

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THE BIOPSY IN DERMATOLOGY*

C. BARRETT KENNEDY, M. D.

NEW ORLEANS

In dermatology biopsies are frequently necessary to corroborate the clinical diagnosis. It is by this procedure that skin cancer is diagnosed and that its origin, type, and degree are determined. Alerted by behavior changes in various chronic premalignant lesions, such as leukoplakia, kraurosis vulvae, chronic ulcers, and pigmented moles, we search for transitions into malignancy. Our histologic study can determine therapy and establish a prognosis.

We are careful to tell our patients why we require this study and that our full opinion in their case will be deferred until this is completed. It is not well to use the term "cancer" when we are seeking specimens, for that would be tantamount to giving a diagnosis and patients would be convinced that they had cancer no matter what the biopsy showed. It is well also to find out their tolerance to local anesthetics, whether or not they heal with unsightly keloid, and whether they are bleeders.

To obtain a proper specimen, select a margin away from infected areas. Infiltrate around and beneath but not into the selected site. In small lesions such as small epitheliomas, excise the entire lesion and thoroughly cauterize the base with the actual cautery. Thus, in some instances,

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treatment may be completed at the same time the specimen is secured.

In larger lesions, select the margin and include some of the normal skin for comparative histologic study. The centers are too often infected or have undergone fibrous healing or destructive non-specific changes. In pigmented moles we do not biopsy. We excise the entire lesion. Subsequent histologic study of this specimen will show whether this excision has been complete.

If the melanotic lesion is large or if metastasis is suspected because of regional gland enlargement, the case should be handled by a surgeon. With mucocutaneous junction lesions such as those of the lip, genital, or anal regions, surgical confreres are brought into the case, as often the frozen section and extensive surgery in the operating room are life-saving. It is well to understand and follow lines of cleavage for good cosmetic results.

Place the biopsy specimen in 2 per cent formalin and send it to the pathologist. If the specimen is very small and there would be a question as to which is the upper surface, place it on a small piece of paper with any side touching the paper except the base or upper surface, and drop upside down in formalin solution. The pathologist can incorporate this paper in his paraffin block, cut sections parallel to the paper, and thus avoid tangential sections which are useless and annoying. Do not expect good information from a shaved specimen. Send a good history and clinical description with each specimen.

The danger of causing epitheliomas to spread by biopsy is not considered great if the safeguards for handling pigmented lesions and mucocutaneous lesions are followed.

OFFICE BIOPSY IN OBSTETRICS AND GYNECOLOGY*

EDWIN L. ZANDER, M. D.

AND

EDWIN R. GUIDRY, M. D.

NEW ORLEANS

Gynecologic cancer is represented most conspicuously by cancer of the uterus. The purpose of this paper is diagnosis of cancer from the gynecological viewpoint and discussion particularly of the newer methods of diagnosis of uterine cancer.

Before doing this, however, it is deemed wise to make a few observations regarding cancer from a general standpoint. It is believed that the cause of cancer is intracellular rather than an extrinsic factor such as a virus, the normal cell being transformed into a gangster cell of cancer. Heredity is believed by many to play an important part in cancer. Chronic irritations are supposed to predispose to the development of carcinoma. Ovarian hormones also play a possible role in carcinogenesis. Precancerous lesions are those lesions which histologically are of borderline type and which therefore are difficult to diagnose microscopically.

Formerly surgical biopsy was the only method used to confirm diagnosis. Now, with newer methods biopsies are increasing due to earlier diagnosis of cancer even in cases in which the cervix is normal in appearance.

METHODS

The methods of detection include use of the finger, the eye, and biopsy. The following are some of the office procedures:

- 1) Colposcopic examination introduced by Hinselmann in 1927 which has never been very popular in this country.
- 2) The tincture of iodine and potassium iodide test of Schiller has little value other than suggesting promising points for biopsy in early stages of cancer with no gross lesion.
- 3) Still another recent advance and one to be discussed in more detail in this

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paper is the test developed by Papanicolaou and Traut published in 1943. They established that cancer is an exfoliative lesion and it is possible to demonstrate it in a vaginal smear. This test cannot take the place of biopsy in decisive diagnosis of cancer, its chief function being a screening test in the search for cancer on a large scale in ostensibly normal women. It requires a trained cytologist.

- 4) Biopsy remains the one positive diagnostic procedure.

A lack of knowledge of these methods and their utilization by the medical profession is a contributing factor in the high mortality from cancer.

SMEAR TEST

The diagnostic value of the smear test as described by Papanicolaou and modified and improved by several authors since its original conception, is based on the constant exfoliation of malignant neoplasms which have a free surface, the cells becoming detached singly or in clusters. Small fragments of tissue in the form of cell cluster are found frequently in cancer smears and indicate exfoliation and they retain structural characteristic of the neoplasm.

The size and form of the nuclears are not significant. The cytoplasm of the undifferentiated cancer cells is usually basophilic but in some differentiated cells it is strongly acidophilic. The form of the cancer cell depends on the prevailing type of cancer. When cancer cells appear in clusters they offer additional proof of the diagnosis.

The advantages of the smear test are:

- (1) Simplicity and inexpensiveness.
- (2) Reliability in hands of experienced men.
- (3) Permits early recognition of incipient cases in situ.
- (4) Can be carried out on a large scale.
- (5) It does not conflict with any established methods of pathologic diagnosis such as biopsy or curettage.
- (6) May reveal cancer where biopsy has failed and *vice versa*.
- (7) Used in follow up to determine progress of irradiation or other therapy.

The main disadvantages are (1) Criteria not yet clearly outlined. (2) Type and

origin of malignant cells are not always clear. (3) Does not show grade of malignancy. (4) Does not give information as to mitotic activity. (5) Takes longer time for examination of smear.

The principle of the smear is that the vaginal secretion aspirated contains a mixture of normal cells, mucus, leucocytes and blood, and also specifically malignant cells exfoliated from any growth which may be present in the genital tract. Therefore, periodic vaginal smears can easily be suggested to women as a method of combatting cancer.

The cytology smear is really a "surface biopsy." The smears taken from the cervical os give a more rapid and more efficient identification of the malignant cells as 80 per cent of genital malignancies arise from the cervix or endometrium. In cervical malignancy the smears are taken directly from the surface of the growth, whereas in fundal carcinoma larger numbers of malignant cells will be found in the mucus at the cervical portal than would be disseminated over the more capacious vaginal floor. It is well worth the effort to insert a speculum and take the smear from the external os.

Cutting operations through a cancerous lesion carry the hazard of trauma, bleeding and lymphatic extension. It is better to confirm the malignancy preoperatively by a cytology smear, and after a positive diagnosis do a biopsy and give treatment accordingly. Sepsis presents a definite contraindication to a surgical biopsy.

In a patient with a positive Wasserman and a cervical lesion, clinically suspicious of malignancy, smears render helpful differentiation.

Technic of making smears: This technically simple method of making a presumptive diagnosis of uterine cancer in daily office practice makes the early discovery of female genital malignancy practical. The technic for taking vaginal smears is described by Papanicolaou. A slightly curved glass pipette, 8 inches in length, is attached to a 3 inch rubber suction bulb. The pipette must be absolutely dry and the patient must

not have douched the same day. Water destroys cellular details. Material is removed from os or fornix. The material is blown on a slide which is immediately dropped into a bottle of fixative $\frac{1}{2}$ ether and $\frac{1}{2}$ 95 per cent alcohol. Do not allow to dry on slide. Fix for five minutes. At this point the specimen may be sent to a cytology laboratory. The rest of the process of staining follows: Wash through 70 per cent—50 per cent alcohol to distilled water. They are then stained with Harris hematoxylin dipped four times in 5 per cent solution hydrochloric acid, washed in running tap water and placed in 5 per cent solution lithium carbonate for one minute. The slides are washed again in running tap water, rinsed in distilled water, and run up through the alcohols (50, 70, 80 to 95 per cent alcohol.) They are then stained for one minute in a 0.5 per cent solution of Orange G in 95 per cent alcohol. The smears are next washed in two changes of 95 per cent alcohol. They are stained in Ea 36 to 2 minutes, washed in three changes of 95 per cent alcohol, run through absolute alcohol to xylol, and mounted in Canada balsam.

In any clinically suspicious case one negative smear cannot be depended upon to exclude the presence of cancer.

Low power microscopic examination shows usually:

- (1) Large number of leucocytes chiefly polymorphonuclear.
- (2) Numerous bacteria.
- (3) Red blood cells are usually found with loss of clear cut outlines appear crenated, degenerated or as shadow form.
- (4) The degree of cornification is frequently higher.
- (5) Histiocytes very common large foamy cells, multinucleated cells whose cytoplasm engulfs leucocytes, cellular debris and red blood cells.
- (6) Bizarre cellular form cytoplasm is hyperchromatic, contains deeply stained granules. Vacules are frequently found with ingested cellular debris. Cells with arrested phases of mitosis.

The spatula technic as developed by Ayer can also be used, which is a means of collecting the cells before their exfoliation. This is done by utilizing a small spatula to scrape gently the surface of the tissue at the precise squamocolumnar junction. The cells and secretion are then transferred to a glass slide and the smear is prepared in the usual fashion. This method permits selectivity of cells collected so that a large concentration of squamous cells from the key point may be studied while still in an excellent state of preservation before they have shrunk or degenerated. A hook end spatula is used in a rotary movement, to obtain material after the mucus has been removed as in the Papanicolaou manner. This causes mild bleeding which is harmless and transient.

It must be emphasized that cytological practice requires highly specialized technic with care and precision in taking of test, skill in staining with excellent Papanicolaou stain, and experienced judgment on the part of the cytologist. Hunter and Ayre also developed centrifuge cytology technic, by gathering up the sediments from the bottom of the bottle. The specimen is centrifuged, then mounted in paraffin, sectioned and stained.

BIOPSY METHODS

Biopsy for obtaining material for study of carcinoma in office practice can be carried out in several ways. For study of intra-uterine lesions all that is needed is to secure two or three small strips of endometrium which may be readily obtained with a long curet or a hollow suction curet such as that devised by Novak and by Randall. With patient in lithotomy position, a careful bimanual examination is made. The cervix is exposed with a speculum. An antiseptic is applied to the cervix, which is grasped with a single-toothed volsella. A uterine probe may be inserted to determine the length and direction of the uterine cavity, but this is not essential. Then the suction curet is gently introduced past the internal os up to the fundus of the uterus. The curet is gently but firmly pulled down along the anterior uterine wall until it reaches

the internal os. Then it is pushed back into the uterine cavity and turned to one side or the other and again withdrawn gently but firmly against the uterine wall and removed from the uterus. The cutting edge of the curet is then inserted in a small bottle of formalin or other fixing fluid and on blowing at the other end of the curet, two pieces of endometrium will be forced into the fixing fluid. The Novak and Randall curets are suction curets, but they may be used without suction, as just described. The pieces of endometrium removed must be stained and studied microscopically.

Tissue from the cervix can also be obtained in the office. There are special punch instruments devised for securing a good sized piece of tissue for diagnosis. To study the cervix, a tenaculum is applied to a healthy part of the cervix and not to the area under suspicion. With a sharp scalpel, a piece of tissue is excised which includes not only the entire area under suspicion but also at least 1/4 inch of healthy tissue all around it. The piece should be at least 1/8 inch deep if cut at right angles or at least 1/4 inch deep if cut wedge-shaped. The tissue should be placed in formalin or other fixing solution immediately. Bleeding may be checked by cauterization or by a small vaseline pack. Both of these methods may cause hemorrhage, infections or metastasis and are preferably done in a hospital.

SUMMARY

An attempt has been made to describe the technic that can be used in office practice in diagnosing carcinoma of the female genital tract by the general practitioner, and to give the principles involved, as well as the pathology. An evaluation of each method is given.

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THE USE OF BIOPSY IN UROLOGIC PRACTICE*

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 NEW ORLEANS

Early and accurate diagnosis is of utmost importance in the treatment of urologic malignancies. The extent and nature of every tumor must be established to insure the most effective form of therapy. Although the location and extent of a tumor can usually be determined clinically, histologic study is the only way that the true pathologic characteristics of a tumor can be established. Accurate diagnosis is particularly important in the early stages of cancer since these are the only ones which are truly curable. The exact pathologic diagnosis of tumors is often extremely difficult even under the best circumstances. A gross description of the lesion, its extent and location and similar clinical data given to the pathologist will often be of great assistance in evaluating the microscopic picture. It is no longer feared that the incidental trauma associated with removal of material for biopsy tends to cause dissemination of a tumor. This has never been proved, but even if it is a possibility, it would not preclude the taking of a specimen for biopsy because at present this is the only means by which an accurate diagnosis can be made.

Tumors of the bladder are the commonest urinary tract malignancies. These lesions, which usually give rise to intermittent, painless gross hematuria, are discovered by cystoscopic examination and specimens for biopsy are taken from all suspicious areas. The specimen is taken with flexible forceps passed through the operating cystoscope, or else with the Stern-McCarthy resectoscope. The latter method is often preferable, for a larger and more representative sample of tissue may be obtained. All specimens are submitted for histologic study, with particular emphasis

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on grading. The grade of the tumor, its nature, its extent, and its location are the four most important points to consider in determining the type of therapy to be employed.

Carcinoma of the urethra is a more common condition than is generally supposed. This is especially true in women. The cardinal symptoms are frequency, burning, bleeding and pain, which occur early in the course of the disease. In the male, obstructive symptoms are produced by those lesions deep in the urethra, and the condition often is treated as a benign stricture until swelling of the penile shaft suggests a malignant growth. Biopsy and the operative removal of these lesions are relatively simple and the possibility of a clinical cure is often good.

Cancer of the penis is responsible for about 2 per cent of malignancies occurring in the male. It is limited almost exclusively to uncircumcised individuals. Prophylactic circumcision of all healthy male babies would greatly reduce the incidence of this form of cancer. The lesion usually begins in the coronal sulcus and is hidden by the prepuce. Phimosis and retention of smegma appear to be important causative factors. Specimen for biopsy is easily taken from the surface of these lesions, and biopsy should always be done to rule out malignancy in chronic, sloughing or proliferative penile sores.

Cancer of the testicle usually occurs in men under the age of forty. These tumors as a rule are highly malignant. Fortunately, they are not common, representing about 4 per cent of all tumors in the genitourinary system. Though many of these tumors are embryonic in nature and a positive Aschheim-Zondek reaction may be obtained, this test is not to be relied upon, chiefly because of the danger of false negatives. A highly malignant tumor may not give a positive reaction. A far better method of diagnosing these tumors is to expose the testicle surgically, obtain a biopsy specimen and submit this to frozen section; if the section is reported malignant, orchidectomy with high ligation of

the cord can be immediately performed. An aspirating needle should never be employed to obtain a specimen for biopsy.

Carcinoma of the scrotum, once common among the chimney-sweeps of England, is now relatively rare. It seems prone to occur in paraffin, tar, and dye workers. The growth usually begins as a wart or ulcer and is similar to carcinoma of the skin occurring elsewhere. It grows slowly and metastasizes relatively late. Suspicious lesions here as elsewhere require biopsy.

Carcinoma of the prostate is usually so far advanced when discovered that a complete cure in a strict clinical sense is impossible. In these cases transurethral resection relieves the patient's urinary symptoms. Orchidectomy and endocrine therapy will in many cases prolong life and contribute greatly to the patient's comfort. All tissue removed in the course of resection for supposedly benign hypertrophy should be examined in an effort to detect any localized areas of malignancy which may have escaped clinical notice. In small early carcinomas of the prostate perineal prostatectomy offers the only chance for complete cure. Biopsy specimens of rectally palpable nodules on the periphery of the prostatic capsule should not be obtained by needle puncture as the chance of not obtaining a representative sample of malignant tissue is too great. A far better plan is to expose the gland perineally. A frozen section of the suspicious nodule is obtained and radical perineal prostatectomy is immediately done if a histologic diagnosis of malignancy is made.

Recently, Papanicolaou¹ has developed a method of detecting neoplasms of the urinary tract by a study of cells in the urinary sediment. The technic is much the same as that used in the study of vaginal smears for the detection of uterine carcinoma. A similar approach to prostatic cancer by studying prostatic secretions is being tried by Herbut and Lubin.² Neither of these methods is a substitute for biopsy and must only be considered as an adjunct to it. Both methods require special staining and as yet are in the experimental stage. However,

by virtue of their simplicity they may eventually be of great value in cancer detection clinics as screening methods for singling out early carcinoma of the urinary tract.

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BIOPSY (PROCTOLOGY)*

MAURICE LESCALE, M. D.

NEW ORLEANS

Rich are the rewards of early diagnosis of cancer of the anus, rectum and sigmoid colon. Richer are the rewards of early diagnosis of precancerous lesions about these parts, because of the ease or facility with which so many of them can be removed in comparison to major type surgical procedures necessary for complete eradication or removal after they have undergone malignant changes. These latter operations are often mutilating in character and frequently are done to no avail as incomplete removal, or metastases, or both, preclude a favorable outcome. To put it differently, early operations on precancerous lesions are usually simpler, safer, easier on the patient and prevent the later necessity for major surgery.

These points cannot be over emphasized because so many patients have a tendency to procrastinate if told their lesion or trouble is not cancer but is a precancerous one. Many, if told it is not yet a cancer are willing to postpone the surgery required.

In proctology, as much as in any other field, biopsy is an important adjunct in the diagnosis, or ruling out of malignancy, of all doubtful lesions in and about the anus and rectum. In some, biopsy is the *sine que non*. Biopsies in proctology have immense value in differential diagnosis. Too often there is the feeling or attitude toward biopsy that its usefulness is limited to a green light or go-ahead signal for surgery. Not enough emphasis is placed on its use-

fulness at times in changing a diagnosis whereby lesions (amebomas, etc.) which are amenable to medical or non-operative measures are not subjected to major surgical procedures. Some conditions that are at times mistaken for malignant ones include lymphopathia venereum, tuberculosis ulcerations and proliferations, perianal chancres, anal fissures, polyps, enlarged anal papillae, fistulae, and hemorrhoids,—thrombosed, eroded or ulcerated. These are diagnosable by their clinical appearance and a biopsy is not often required. But if doubt exists after thorough examination, always biopsy them.

The collection of specimens for biopsy in the field of proctology follows the usual practices for the collection of good biopsy specimens generally, with modifications necessitated by the differences in the anatomy of the region and the problems of endoscopic manipulation of the biopsy forceps or collecting instruments. At least two specimens should be obtained, one from the center of the mass or ulcer, and one from the edge, which means a section extending from the pathological into normal tissue, in other words, from the transitional zone. The section may be a thin one but should be relatively deep to reveal the subsurface changes that are often of diagnostic import. If the lesion is large, sections from several areas should be obtained. Hemostasis should be thorough before the patient is allowed off the table. Most bleeding will check spontaneously but it is unsafe to place complete reliance on this. At times troublesome bleeding continues and requires more active measures for its control, such as pressure with cotton (plain or soaked in astringent solution) or electrodesiccation. The newer hemostatics such as Gel-foam and Oxycel may be used. Some say that bleeding is never troublesome following biopsy, but this is an over-statement as at times bleeding is sufficient in quantity to alarm the patient and to tax the ability of the surgeon to control it, especially in high-lying lesions where the blood and clots obstruct the view of the bleeding point or points and movable lesions such as pedun-

*Read at meeting of the Orleans Parish Medical Society, November 10, 1947.

culated polyps recede and rotate, thus changing the presenting surface.

Reference has been made to endoscopic specimens. This naturally entails the use of the procto-sigmoidoscope. Details of the use and manner of passage of these instruments are beyond the scope of this discussion, but one point should be mentioned here relative to the type of procto-sigmoidoscope used. Instruments with the illumination or electric bulb at the distal end have less shadows than those with proximal-end illumination which allows the biopsy forceps to be interposed between the source of light and the lesion.

There are many lesions which are easily accessible and about the nature of which we are relatively certain from the clinical picture they present. This group includes non-malignant entities such as hemorrhoids, enlarged papillae, fissures, fistulas, fibrous polyps; and another group such as epitheliomas of the malignancy, of which there is little or no doubt. Instead of obtaining a biopsy specimen and then operating, one procedure should be employed and that one should be complete surgical eradication of the lesion or lesions and all tissue should be sent to the pathologist for complete study. This often saves the patient an extra operation and has great value in affording the pathologist larger and better specimens with which to work. All tissue removed at operation even when not considered malignant clinically should be sent to the pathologist routinely because reports of unsuspected malignancy have often been returned on what had appeared to be non-malignant tissue.

Whenever there is any doubt concerning the true nature of an anal or rectal lesion, a biopsy specimen should be taken for examination. Where clinical diagnosis of carcinoma has already been made, biopsy should be used for confirmatory proof, and to classify or grade the malignancy of the tumor for prognosticating the end-results and to assist in making a decision as to methods of treatment,—surgery or radi-

um,—because low grades of malignancy by Broder's classification are better handled by surgery and the higher grades by radium. However complete reliance cannot always be placed on biopsy classification of grades of malignancy. This is as true in proctologic specimens as in those from other regions.

A NEW RETRACTOR FOR USE IN THYROIDECTOMY

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One of the most widely employed instruments for retaining the skin flaps open during thyroidectomy is the Beckman retractor. I have used it for years but it has repeatedly manifested a number of defects. Two of the most obvious are that it frequently slips out of position and its extended handles get in the way of the assistant.

The instrument herein presented is intended to overcome these faults. I devised it with the idea of having something recessed and unobtrusive to securely hold open the skin and subcutaneous tissue.

It consists of two 1/4 inch round rod tracks on to which is firmly affixed a curved sustaining rod coming off the ends at an angle of 44°. This sustaining rod, made of 3/16 inch steel is so curved as to conform to the base of the neck and chest. In the center of this rod are affixed claws for retracting the skin. Another curved sustaining rod is movable on the tracks being affixed to sliding cylinders. This rod likewise has claw retractors in its center. The curves of the sustaining rods permit a minimum of the instrument to be present in the field of operation and the design is such that the main portion of the instrument is recessed into the lateral spaces around the neck. After the wound is opened the retractor claws are placed under the skin flaps and the retractor is separated. The desired width of the opening is held secure by thread screws.

The use of this instrument in a number

of cases has proved it to be most effective and very secure.*

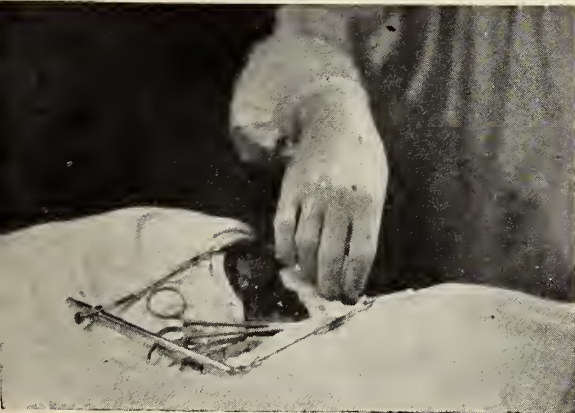
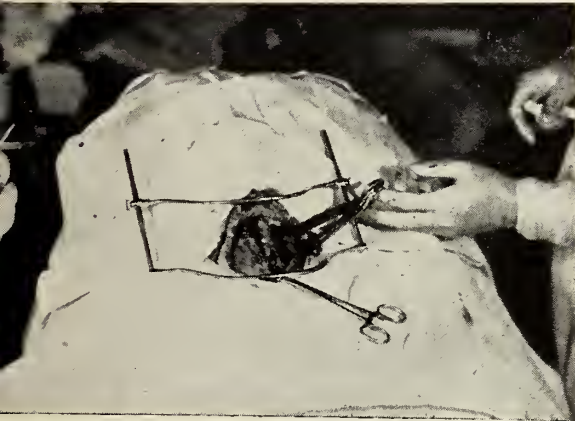
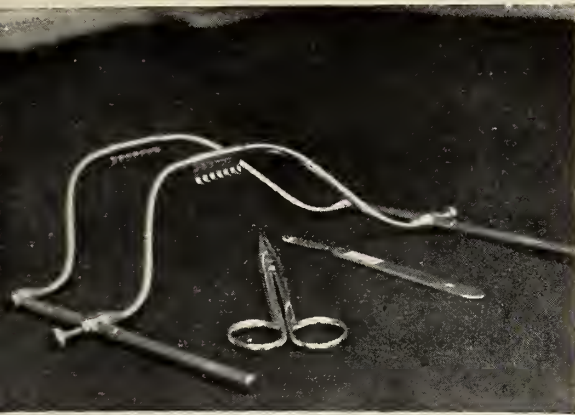


Fig. 1. a.) Self-sustaining retractor for skin flaps in thyroidectomy.

b.) The retractor in use as seen from above.

c.) The retractor in position, shown from a side view.

*The retractor will be produced by A. S. Aloe Co., St. Louis, Mo.

SALMONELLA BLEGDAM INFECTION A REVIEW OF LITERATURE AND REPORT OF A CASE

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The first case of *Salmonella blegdam* was reported in 1935 from Blegdam hospital, Copenhagen. A second case was reported from Shanghai about one year later. In December, 1944, fifty cases of proven *Salmonella blegdam* infection were reported from New Guinea, Buna, and Bougainville by medical officers of the Australian army located in that area. Another series of fifteen cases was reported in the Australian forces in New Guinea and Buna subsequent to the above date. About the same time, five cases of natives of the island were found, manifested by enteric like fever. In the same group, one fatal case was reported in a Japanese prisoner of war. The case which follows is the first from which the organism has been cultured in the United States.

Symptomatology of the enteric fever was divided into three categories:

1) Simple diarrhea with stools containing mucus, with nausea, vomiting and abdominal pain.

2) *Salmonella* fever resembling typhoid fever, showing hyperpyrexia, malaise, leukopenia and a slow pulse rate. Forty-five per cent of the cases reported exhibited this syndrome.

3) *Salmonella* fever with septic complications, the organism spreading through the blood stream and localizing in various parts of the body.

During the first two weeks, the course resembled *Salmonella* fever. From there on various manifestations occurred including cystitis, peritonitis, perichondritis, epididymo-orchitis, abscess of the buttocks, cholecystitis, pericarditis, ureteritis, empyema, and bronchopneumonia. The salient features are an incubation period of approximately two weeks' duration, fever, toxemia in all cases plus a slow pulse rate; in 12 per cent a skin rash consisting of rose spots or macules on the abdomen, arms and legs. Abdominal distention, doughy abdomen, abdominal tenderness, and diarrhea were usually present.

REPORT OF CASE

A 25 year old white female was first seen by Dr. Henington on November 11, 1947. At this time, the patient had a weeping erythematous dermatitis in both popliteal fossae and on the anterior and posterior surfaces of each thigh. This had been present for two weeks; the temperature was normal; there was no adenopathy; and the throat was clear. A tentative diagnosis of dermatitis venenata was made. The patient was given a soothing compress of 4 per cent boric acid followed by a shake lotion. During the period of two weeks, eruption became worse and spread to other parts of the body. The weeping had stopped, and the eruption was simply an erythema and scaliness not unlike the rash seen in scarlet fever. There were no petechiae and no vesicles.

The patient was admitted to the dermatology service because of the severe skin lesions. The family, medical and surgical histories were negative. General physical examination was negative, except for bilateral palpable inguinal nodes and skin lesions as described above. A tentative diagnosis of severe, allergic, pruritic dermatitis was made.

Course in Hospital: The patient's temperature was 100.2. There were three bouts of fever; the first of which reached 104.4° F, the second, twenty-four hours later reached a peak of 103.4° F, and the third lasted for three days reaching peaks of 104.8, 105.2, and 105.4° F, on successive days. The first and second febrile reactions occurred on the third and fifth hospital days, and the third occurred on the tenth hospital day. Temperature fell by lysis after the second and third bouts of fever.

Blood cultures were taken at the height of the fever and were overgrown by contaminants. Agglutinations were negative, and all other laboratory work including urinalysis and stool examinations were within normal limits. The total white count reached 11,000, and the patient developed a rather severe anemia following the third febrile reaction. A stool culture taken at the height of the fever revealed *Salmonella blegdam*.

The hyperpyrexia was controlled with alcohol sponges, cold enemas and cool wet sheets. On the fourteenth hospital day, the characteristics of the rash changed somewhat and resembled that of scarlet fever.

Treatment included penicillin 50,000 units q.3.h. for nine days after admission with no apparent improvement. Pyribenzamine, 100 mg. was given q.4.h. until the eleventh hospital day. Streptomycin 5 Gm., q.4.h., was begun on the eleventh hospital day, decreased to 2 Gm., q.3.h., next day, and was discontinued several days later. Para amino benzoic acid, 2 Gm., q.4.h., was begun twenty-four hours after streptomycin was increased 2 Gm., q.2.h. the following day and was discontinued five days later. Twenty-four hours after para amino benzoic acid was begun the temperature became normal and remained so.

The patient was discharged on the twenty-second hospital day.

An attempt was made to determine the origin of the patient's infection. Her husband was stationed in the Southwest Pacific and Japan during the war. Several stool cultures run on him were reported negative for *Salmonella blegdam*.

Attempts to agglutinate the original culture of *Salmonella blegdam* with the patient's serum were unsuccessful six weeks after discharge. Failure to agglutinate the organism might be explained by the length of time which had elapsed before test was attempted.

Since the organism was isolated by the pathology department at Southern Baptist hospital, the same organism has been isolated by the pathology department of Touro Infirmary from a blood culture of a patient of Dr. M. Loeber and Dr. J. L. Dyer. The serum of this patient showed a significant agglutination for *Salmonella blegdam* when it was checked several weeks later.

Note: The author wishes to express his appreciation to Dr. V. M. Henington and Dr. W. H. Gillentine for their assistance and permission to report the case, and to Dr. M. Loeber and Dr. J. L. Dyer for permission to mention a similar case which was treated by them.

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BILATERAL BRODIE'S ABSCESS
REPORT OF A CASEE. R. RIGGALL, M. D.
PRAIRIE GROVE, ARKANSAS

A review of the literature for the last five years failed to reveal any reported cases of bilateral Brodie's abscess, and the following case is considered, therefore, of sufficient rarity to warrant reporting.

CASE REPORT

A 19 year old boy entered the hospital because of recurrent pain in the right ankle of over four months' duration. The pain, deep, and of a boring quality, was made worse by weight-bearing, and he had worn crutches for the previous three months. Three weeks before admission the ankle had become swollen and was lanced by a local

physician. The wound was made on the lateral aspect and yielded sanguine-purulent material. The drainage continued until admission. One week previous to admission the medial aspect of the ankle became similarly swollen and painful, but to a lesser degree than the lateral side. The patient further stated that when the ankle was causing the most pain, he could palpate "kernels" in the right groin and behind the right knee.

A review of the past history elicited an episode similar to this eight years previously. The disorder subsided spontaneously at that time and gave no further trouble until the onset of the present illness. There was no obtainable history indicative of acute osteomyelitis at any time.

Physical examination was negative except for the right ankle. This was swollen and dusky in its entirety, but most markedly on the lateral surface. Here over the malleolus there was a draining sinus emitting grumous discharge freely. Pain and tenderness were noted, and it was observed that the patient was completely disabled.

X-rays showed a cavity in the centre of the tibial shaft at its lower extremity with an area of destruction extending to the lateral cortex.

The patient received penicillin 15,000 units every four hours for ten days (900,000 units) and was then deemed ready for surgery. Under general anesthesia (ether, open) the lower end of the tibia was approached through a three inch incision in the medial side of the ankle passing anteriorly above and below the internal malleolus. The periosteum was found to be greatly thickened, and the bone was honeycombed from a point just above the internal malleolus upwards for a distance of one and one-half inches with extreme roughening of the cortex. The bone cortex covering the Brodie's abscess was chiseled away and considerable granulation tissue, grayish in colour, jelly-like in consistency, curetted. A diverticulum which admitted the fingertip led away distally and medially from the main abscess cavity to open into the soft tissues behind the malleolus. Curetting here also yielded granulation tissue, and a hemostat was pushed through from the abscess cavity to the surface, cut down upon, and a rubber drain brought through. The cavity itself was dusted with sulfathiazole crystals (about 3 grams) and packed open with vaseline gauze. Convalescence was uneventful.

Dr. A. J. Flack, Director, Institute of Public Health, Faculty of Public Health of the University of Western Ontario, reported on the specimen as follows: "The specimen consists of a number of grayish red pieces of soft tissue with some irregular bony fragments. The pathologic condition is Brodie's abscess. Sections show the abscess cavity to be partially lined by granulation tissue and in the wall there is a proliferation of connective tissue which shows a moderately dense infiltration of plasma cells, lymphocytes and polymorphonu-

clears. The microscopic picture is that of a chronic abscess and is compatible with that of Brodie's abscess. There is no evidence of malignancy."

On second admission six months later the patient complained that he had sprained his left ankle twice in rapid succession about one month before admission. Since that time he had experienced some pain and disability with slight swelling of the joint. He was afebrile.

Roentgenograms of the extremity revealed a

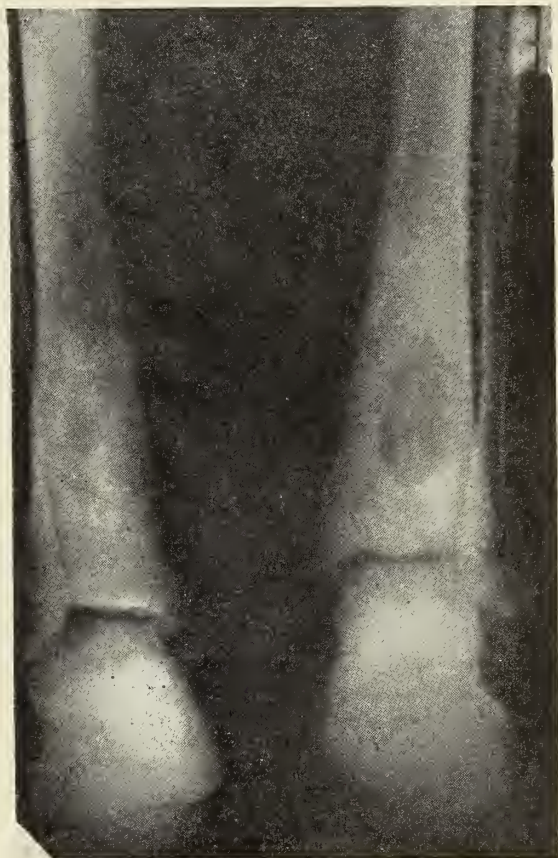


Fig. 1—X-ray made on first admission showing bilateral lesions.

Brodie's abscess in the left lower tibia with slight elevation of the medial periosteum. The original plates were then consulted, and a previously missed area of rarefaction surrounded by eburnation was demonstrated in the same position as that occupied by the lesion noted on the new plates.

Therapeutic management was similar to that noted above and the postoperative condition was excellent with the patient being discharged on the sixteenth postoperative day. The report of the pathologist again confirmed the clinical diagnosis.

The patient continues symptom-free three years postoperatively.

The therapy of these cases has been re-

cently reviewed by Buchanan and Blaire. In their series of cases, the best results follow pre- and postoperative penicillin administration. The operative measures are saucerization of the focus with primary closure of the operative site. This is in agreement with the therapy preferred by the English authors (Illingworth, et al; Bailey and Love).

In the *Medico-Chirurgical Transactions* of 1832, Mr. (later Sir) Benjamin Brodie, Surgeon, St. George's Hospital, London, first described a "circumscribed abscess lined with a granular membrane surrounded by sclerotic bone". He pointed out at the time that an abscess may occur in the interior of any bone, but according to his experience it is more common in the tibia than in any other bone. He gave a brief account of eight cases.

Chronic foci remaining after an episode of acute osteomyelitis have been reported as Brodie's abscess, but the abscess as originally described begins as a chronic process. It is true that it may show its relation to the usual forms of bone infection by occasionally developing a more acute course than previously. It is for these reasons that Hertzler advises that the term "false Brodie's abscess" be applied to those following acute infections. Henderson and Simon found that of 145 cases of bone abscess, only 23 were true Brodie's abscesses. We may presume the lesion to be an unusual, if not rare, one.

There is yet a third contender for the title of Brodie's abscess. Phemister has described localized areas of fibrous or granulation tissue which he chooses to call "chronic fibrous osteomyelitis". The failure to cultivate bacteria from such areas does not rule out their probable infectious basis, and these areas deserve, probably more than those abscesses following acute osteomyelitis, to be called Brodie's abscesses.

The discoverable pathology is that of an attenuated infection with a mild reactive process, granulation tissue formation, and the deposition of new bone. The latter finds expression more by a sclerosis than

by an increase in volume, although the bone often may be thickened about the site of disease. At operation, the increased resistance offered the chisel confirms the diagnosis before the abscess is reached. The abscess itself is usually small, varying from 0.25 cm. to 2.5 cm. in diameter. The cavity is filled with a granular material containing small particles of bone, but seldom true bone spicules. In older abscesses the center of the lesion may be clear and the walls lined with a membrane suggesting a bone cyst. However, abscesses are always unilocular and surrounded by sclerotic bone; cysts, on the other hand, are multilocular and usually surrounded by rarified bone.

Histologically the early cases are characterized by the presence of granulation tissue comprised largely of plasma cells, but leukocytes are abundant. In cases of longer duration there is a definite pyogenic membrane with the typical fibrous tissue wall and granulation tissue lining. The bacteria found have been most commonly staphylococci, less often streptococci, and in rare instances, hemolytic streptococci (Wilensky). In the case of Phemister's "chronic fibrous osteomyelitis" leukocytes and lymphocytes may be absent and the tissue resembles the lining of bone cysts. In some cases giant cells may be found. It is upon the latter finding that Barrie bases his contention that giant cell tumors are primarily inflammatory in nature.

Ogilvie suggests that the primary lesion is a strain of the extremely vascular juxta-epiphyseal region coupled with a general lowered resistance in the presence of foci of infection elsewhere.

Similar to acute osteomyelitis, the disease is one of adolescence, but owing to its chronic, non-debilitating nature, it may not be discovered until adult life.

The onset is usually slow in character and the most common symptom that of deep, boring pain, often, as is characteristic of bone pain, worse at night. As the focus is frequently near the epiphyseal line, joint pain is simulated frequently. Tapping over the site of disease is painful, but periostitis is rare. In some cases ex-

udation into the joint and swelling of the soft parts may be seen. In most cases a swelling of the bone (which can often be ascertained by simple palpation) and eburnation of the bone about the abscess occur. The latter may achieve such density that the underlying cavity fails to visualize on the roentgenogram.

The course of the disease is characterized by intermittent bouts of pain—increasing in severity and usually near the end of a long bone—which is usually insufficient to disable the patient. Fever is seldom present. After a free interval (sometimes months in duration) the pain returns for a few days or weeks. The condition is often considered to be rheumatic, and the course may continue, as in one case reported, for more than fifty years. In the most acute cases, the patient may show a hot, red, tense, fluctuant swelling, with some edema of the affected limb.

The location and size of the abscess can usually be made out on the x-ray plate, but in some instances it is too small and it may be overlooked, especially if the plate is developed too darkly. Rigler describes the roentgenologic appearance as being a "localized defect near the end of a long bone surrounded by a zone of sclerosis or increased density". He further states that the differentiation from tuberculosis may be difficult.

Statistically, the tibia seems to be the most frequently involved site. This confirms Brodie's original observation. Hertzler cites Koenig (*Lehrbuch d. spec. Chir.*, 1865, Bd. 3, s. 540) as his source for the statement that 75 per cent of the abscesses occur in this bone. The proximal end is most frequently, and the diaphysis only occasionally diseased. Brailsford reports 40 cases of tibial involvement and 22 in other areas. The majority of cases occur between 11 and 30 years of age, and the male-female ratio is 2:1.

The differential diagnosis of Brodie's abscess includes bone cysts, chronic sclerosing osteitis, sarcoma, gumma, endothelial myeloma, and tuberculosis.

The bone cyst usually presents no symp-

toms of pain, a spontaneous fracture being frequently the first sign of this disease. In addition, roentgenology reveals no surrounding osteosclerosis.

Chronic sclerosing osteitis involves the medulla principally, giving rise to a spindle-shaped bone with a thickened cortex, narrowed medullary cavity, and no typical area of rarefaction.

The usually abrupt onset of sarcoma with its typical roentgenographic appearance of an extensive and destructive process without regularity of outline differentiates this condition with ease.

The massive reaction of adjacent bone characteristic of gummatous degeneration of bone, the persistent and intolerable night pains, and the positive serology make this diagnosis by no means difficult.

Tuberculosis of the bone is destructive and leads to the early formation of sinuses and sequestra and there is no eburnation of the surrounding bone.

A careful history, physical examination and roentgenologic study will rule out the arthritic conditions.

The discovery of an osteoclastoma at this stage would be purely accidental, for the signs and symptoms are negligible. The radiographic appearances are quite similar, and therefore, the clinical history would be necessary for differentiation.

The course of the myeloma is far more rapid than that expected of a Brodie's abscess as is revealed by the history, and serial radiographic study or biopsy will provide the diagnosis.

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INTRATRACHEAL ANESTHESIA— ITS USES AND ABUSES*

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AND

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It is not difficult for even an anesthesiologist to understand why there might be an aversion to intratracheal anesthesia in some medical circles. This is largely because some of us have at one time or another witnessed an attempted intubation which would make Custer's last stand seem like an anemic affair by comparison. Moss¹ has stated, "ploughing up the pharynx with a laryngoscope in an attempt to dig out an epiglottis from a pool of bloody mucous is one of the least inspiring sights of modern anesthesiology". We certainly agree with Moss. Memories of the occasional difficulties linger on; the times it has been employed uneventfully are forgotten and often never appreciated. Irrespective of the impressions one gains by casual observation it cannot be denied the technic is indispensable in certain surgical procedures which are attempted. The advantages of intratracheal anesthesia outweigh the disadvantages by far.

The chief reason for introducing an intratracheal catheter is to assure an unimpeded airway, or stated more simply, its primary purpose is to prevent the patient from choking to death either suddenly or slowly.² Mechanical obstruction, either existent or anticipated, is averted or controlled. Respiratory movement in awkward positions such as the prone or lateral are aided.

In addition, the intratracheal technic allows the anesthetist to withdraw from the operating field when he must struggle with the surgeon for it. Thus, not only is the surgeon assured of asepsis, but he also has

non-interference with his work without jeopardy to the patient. Then also, the intratracheal catheter may be so arranged that a tight seal results between it and the tracheal wall. The patient is thus protected against entry of foreign matter such as vomitus, pus, blood, or mucus, into the trachea. Likewise, suction is available directly for the respiratory tree. This is indispensable when purulent secretions are present. Furthermore, the intratracheal catheter prevents annoying reflex laryngospasm seen most frequently in upper abdominal and intra-thoracic surgery. The advantage of control of pulmonary ventilation in thoracic surgery and the availability of positive pressure are further desirable features obtained.

The disadvantages of intratracheal anesthesia are twofold: the process of intubation may be time consuming and the procedure may be traumatic. Intubation involves in many instances a longer induction period as deeper anesthesia is usually necessary for relaxation and obtundation of pharyngeal and laryngeal reflexes. This disadvantage, probably one of the most annoying to impatient operators, is more than offset by the safety the free airway affords. An experienced anesthetist can intubate in the time required by a neophyte to produce the necessary induction. Gillespie³ has stated "it is wise to regard intubation in the light of prophylaxis rather than treatment—intubation during anesthesia is tantamount to confession of faulty judgment of that case."

The degree of trauma inflicted varies directly with the experience of the anesthetist. On this experience depends the incidence of minor respiratory complications. Mature medical judgment is necessary for an anesthetist to decide whether the advantage of endotracheal anesthesia will outweigh any possible disadvantage in his own hands.

The uses of intratracheal anesthesia parallel its advantages, and are peculiar to operations on various portions of the body.

HEAD and NECK: Intratracheal anesthesia is particularly desirable in opera-

*Read at meeting of the Orleans Parish Medical Society, November 10, 1947.

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tions about the head and neck. In certain instances, particularly in procedures of short duration, intubation may not be necessary and justified. However, since one cannot predict when obstruction may occur, one is justified in intubation of all such cases. In otolaryngological, oral, and neck operations, the anesthetist is able to withdraw from the operative field and still have full control of the patient. In intracranial surgery, one is at ease when an intratracheal airway is in place. Central vomiting and respiratory failure peculiar to operations of this type are more easily managed. Some difference of opinion exists regarding surgery of the thyroid gland. Thyroid surgery usually falls into three classes in respect to the type of anesthesia employed. Certain operations on the gland are done primarily for relief of obstruction due to pressure of the gland on the trachea. All patients undergoing surgery for this cause should be intubated. Patients with goiter who do not have symptoms of obstruction or toxicity may not necessarily require intubation. The decision to intubate or not to intubate depends upon the difficulties arising during induction and the ease with which the airway is maintained without obstruction. However, since one cannot anticipate obstruction, the more conservative stand is to intubate. The good anesthetist is not the one who knows how to get out of trouble, but the one who knows how to avoid it. Thyrotoxicosis always presents a difficult anesthetic problem. The patient is usually a poor anesthetic risk who should not be subjected to deep anesthesia or trauma. However, without intubation laryngeal spasm from manipulation of the gland and trachea during light anesthesia may cause anoxia and carbon dioxide retention which are undesirable in the face of the increased metabolic rate and cardiovascular instability characteristic of these patients. Tracheitis from pressure of the gland may exist preoperatively. The presence of the catheter during the operation may aggravate the condition, particularly if there is excessive manipulation and motion of the trachea. Certain operators still

adhere to the unreliable custom of attempting to avoid damage to the laryngeal nerve by listening for the phonation caused by touching it. Isolation of the nerve is preferred for absolute safety to avert this complication. Lahey is most conservative and prefers intubation for all neck surgery.⁴ He advocates exposure of the nerve.

THORAX: Intratracheal anesthesia is indispensable for intrathoracic operations. Prior to the introduction of this type of anesthesia it was almost impossible to perform intrathoracic operations with satisfactory post-operative results. Not only are these operations difficult because the pre-existent pathological processes interfere with proper pulmonary ventilation, but also positioning on the operating table interferes with adequate respiratory movements. In addition, mucus, pus, blood, and other secretions are usually present in the air passages and further interfere with adequate ventilation. The pneumothorax, although on one side, and the troublesome mediastinal shift cause further difficulties. Intratracheal anesthesia alleviates this by allowing the use of positive pressure, controlled or assisted respiration, and continuous suction. A further modification of the endotracheal technic seals off the bronchus of a diseased lung when copious purulent discharge is present and allows a relative degree freedom of contamination of the healthy lung.

ABDOMEN: Most abdominal procedures are easily performed without intubation. The experienced anesthetist is able to judge by preanesthetic examination or from the patient's reactions during induction whether or not intubation is necessary. Laryngeal spasm during upper abdominal surgery may interfere with adequate ventilation. Straining occurs during such spasm and may present technical difficulties for the surgeon. Likewise, relaxation is difficult to attain because the inadequate ventilation does not allow the requisite amount of drug to pass into the lung. Intubation absolves this difficulty. The routine use of intratracheal anesthesia by the "lazy" anesthetist because it requires less effort

and less attention to the patient than would be required by the ordinary technic is obviously an abuse of the method.

AWKWARD POSITIONS: When awkward positions are necessary for surgery, mechanical hindrance to the airway and poor approximation of the mask are frequent technical problems which make proper administration of anesthesia difficult. The skilled anesthesiologist is more able to control the patient without a catheter in place than the novice. However, he always resorts to its use in the prone position since this is the most difficult of all from the standpoint of anesthesia. Certainly the patient is entitled to the safety the intratracheal tube affords under these circumstances.

Other uses of intratracheal intubation, just to be mentioned, are in irremediable upper respiratory obstruction, for resuscitation, and tracheo-bronchial aspiration when atelectasis, pulmonary edema, and other similar clinical conditions arise. Its use in institutions where non-medical personnel administer anesthetics and the supervisor cannot possibly oversee each anesthetist is mandatory. One of the most difficult tasks that confronts the anesthetist is maintenance of a proper airway. Technician anesthetists do not always recognize obstruction to the airway. An intratracheal tube assures it and guarantees the safety of the patient.

Operations on infants are best done without intubation because of the softness and small size of the involved structures. The cross section of the trachea in infants is reduced in greater proportion by the cross sectional area of the wall of the catheter, regardless of its thinness. Secretions more copious in these subjects are removed with greater difficulty. Obstruction due to edema postoperatively may occur if any degree of trauma is inflicted.

It should be needless to say that intubation is a procedure to be attempted only by individuals who have been instructed in laryngoscopy. This is not always the case, however. In many localities not only are intubations attempted by individuals

who know little more than the rudiments of anesthesiology but also by individuals who are not practitioners of medicine. We would be horrified at the thought of allowing a non-medical person attempt a bronchoscopy. Still, many of us have glibly allowed non-medical personnel to attempt intratracheal anesthesia. There is little difference between the introduction of a bronchoscope and the introduction of an intratracheal catheter except that in the case of the latter the patient is under anesthesia and is utterly defenseless to protest against the trauma inflicted as he would under local anesthesia during a bronchoscopy.

Most of the abuses of intratracheal anesthesia arise from lack of skill or from the exercise of poor judgment. Gentleness and proper relaxation are absolute necessities for intubation. The ability to decide when to go on, when the intubation is difficult, and when to stop are likewise essential prerequisites. Here again mature medical judgment is necessary. When the nasal method is selected, the operator must consider the presence of infection, nasal spurs, and hyperplastic lymphoid tissue in the upper air passages. The presence of these may lead to lower respiratory infection, epistaxis, and adenoidectomy respectively. When the oral route is employed, the laryngoscope must not be pressed against the teeth to pry the jaws apart. A bite block should be inserted before the patient can bite the catheter or injure his own teeth. Most of these are technical details which are easily cared for by most anesthetists.

Extubation is equally as important as intubation, particularly when one considers that 50 per cent of all anesthetic accidents occur after the operation has been completed. Respiratory obstruction and aspiration of foreign substances at the time of tube removal are responsible for a great proportion of difficulties.

Objection has been raised to intratracheal anesthesia by individuals who are not anesthetists and who have had little or no experience with it on the

grounds that the presence of the tube in the trachea is "irritating". It is difficult to conceive how a soft rubber catheter introduced for several hours into the trachea can produce such an effect when a metal tube inserted in a tracheotomy remains for days without any apparent harm. It must be emphasized that the majority of deleterious effects which arise are from trauma due to "bungling" at the time of insertion of the catheter. The well-trained, skilled anesthesiologist is qualified to reduce these difficulties to a minimum.

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SPINAL ANESTHESIA FOR CESAREAN SECTION*

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NEW ORLEANS

Spinal anesthesia is gradually assuming its rightful place in surgery. Its limitations, dangers, as well as its advantages and indications are on the whole well recognized. Its use in obstetrics, however, is still a matter of considerable controversy. Numerous writers have called attention to the fact that its use is hazardous in operative obstetrics. Recently Greenhill¹ stated that of all anesthetics used for obstetrics it is the most dangerous. From collected statistics he has reported a maternal mortality rate of 1:456 attributable to the anesthetic. On the other hand, other authors have hailed it as the most suitable. Freiheit and Magnano² feel it to be the ideal anes-

thetic for Cesarean section. Arnell, in 1945, discussing a paper by Habeeb,³ reported a maternal mortality of 20.8 per cent from spinal anesthesia for Cesarean section at the New Orleans Charity Hospital. Arnell's figure was computed from a series of 24 sections performed under spinal anesthesia during an eight year period. This is not a fair evaluation of spinal anesthesia for Cesarean section because the series is too small. His purpose, however, was to call attention to the hazardous nature of this kind of anesthesia. Those opposed to its use have gained their impression from one or two unhappy experiences. Exactly why it is hazardous, has never been well defined. Is spinal anesthesia more hazardous to the obstetrical than to the surgical patient? If it is, why is it? Can it be made safer? These questions coupled with the paucity of data on spinal anesthesia in obstetrics at the Charity Hospital, have stimulated our interest in studying the problem in more detail and elucidating its hazardous features, if any.

METHOD OF STUDY

Two hundred and eight Cesarean sections were performed under spinal anesthesia from January 1945 to September 1947. All the anesthetics were administered and supervised by the Residents in Anesthesiology at Charity Hospital. In deciding whether or not spinal anesthesia was suitable, the indications and contraindications followed in general surgery were applied to these patients. Those with cardiovascular disease, hypotension, anemia and other complications were excluded. The ages of the patients varied from 16 to 46. The majority were in their twenties and early thirties. Physical and laboratory findings were negative in 89 per cent of the cases. Seven per cent presented specific contraindications to spinal anesthesia. These were abnormalities in blood pressure, chiefly hypertension. The remainder presented complications which do not contraindicate spinal anesthesia, notably diabetes, pyelonephritis, hydronephrosis, early toxemia, and upper respiratory infection.

No premedication was given in 25 per

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cent of the cases. The remainder received atropine or scopolamine in combination with a short-acting barbiturate or dilaudid, within the hour previous to induction of anesthesia. In 101 cases atropine or scopolamine alone was used.

The lumbar puncture was performed with the patient in the upright sitting or the lateral prone position, whichever was more convenient. The site of puncture was at the third or fourth lumbar interspace, whichever was more accessible. Immediately after injection of the drug, the patient was placed in the supine position with the head sharply flexed on a pillow. Ordinarily in general surgery, the patient must be placed in the dependant position to obtain the extent of anesthesia necessary for abdominal surgery. In obstetrics, if this is done, anesthesia extends to the upper spinal segments. Only in five instances was the Trendelenburg position necessary because the anesthesia was not high enough. In three cases in which the level of anesthesia extended beyond the 7th thoracic segment, the reverse Trendelenburg was necessary to prevent further cephalad migration of the drug. In all cases the anesthetic drug was given as a hyperbaric solution, made so by weighting it down with 10 per cent glucose. Pontocaine was used in 54 per cent of the cases, Nupercaine in 37, PT-19* in 5 and Novocaine in 4 per cent. Satisfactory anesthesia was obtained with much smaller doses than ordinarily employed in abdominal surgery. Doses comparable to those used in general surgery caused a "greater spread" and analgesia extended to undesirable heights. Untoward reactions appear to be more frequent when the dosage is excessive. Nupercaine was used in amounts varying from 5-7.5 mgm., Pontocaine 7.5-10 mgm., Novocaine 70-100 mgm. and PT-19 8-10 mgm. Immediately after induction of anesthesia, an infusion was started, primarily to assure having a vein available for the administration of vasopressor drugs, stimulants, or blood. Sixty

eight per cent of the cases received 500 c.c. of blood in conjunction with an infusion of glucose while on the operating table.

The extent of sensory anesthesia ranged between the 10th and 7th thoracic segments in 94 per cent of the cases. In 3 per cent the analgesia was confined below the 10th thoracic segment. This level was not adequate for surgery. In 3 per cent of the cases analgesia extended above the 7th thoracic segment.

RESULTS

From the standpoint of surgery, the results were very gratifying. In many instances, however, there were tense moments for the anesthetist. Hypotension was a most constant and distressing complication. The blood pressure fell in every single case. In 31 per cent of the cases, however, the reduction in pressure was not severe and remained above 100 mm. Hg. systolic. In 69 per cent of the cases, the systolic pressure dropped below 100 mm. Hg. In approximately one third of these it fell to 60 mm. Hg. This fall occurred on an average of five minutes after establishment of anesthesia. It was precipitous, dropping abruptly, once it began to fall.

The hypotension was combatted by the use of ephedrine intravenously. In 14 cases a second dose was necessary because the pressure remained elevated only a few minutes and began to fall again. In four cases a third dose was administered because the pressure dropped again after the second dose. A combination of intravenous and intramuscular injection was used in 45 cases. As a rule, this is a very effective technic to employ. In 9 per cent of the cases ephedrine was administered five to ten minutes before anesthesia was induced. A blood pressure drop occurred in one patient in this group and intravenous ephedrine was necessary to restore the blood pressure to normal limits. In 13 per cent of the cases a hypotension appeared after anesthesia was established and the operation had been under way for some time. Clinical experience has taught us that this fall is due to fluid loss, trauma, or other

*B-(2-piperidyl)-ethyl o-aminobenzoate hydrochloride. Known under trade name of Lucaine.

factors. Vasopressor drugs are not effective at this time and may even be harmful. Blood and fluids were effective in overcoming this complication.

Immediately after delivery of the infant, the blood pressure rose, somewhat abruptly, to above pre-anesthetic levels in 78 per cent of the cases. The elevation averaged 10-30 mm. Hg. systolic. There was likewise a proportional rise in diastolic pressure. There was slowing of the pulse rate after delivery of the fetus in 72 per cent, no change in 22 per cent, and an increase in 6 per cent of the cases. The slowing occurred largely when the pressure rose.

Restlessness, noted in 5 per cent of the cases, was easily overcome by intravenous morphine administered after delivery.

Nausea and emesis occurred in 7 per cent of the cases. Most of these occurred in cases done under PT-19.

Inhalation anesthesia was necessary in 4 per cent of the cases because the extent of anesthesia was not sufficient or the block failed.

Two patients complained of transient headache on the operating table. One was due to a sudden elevation in blood pressure caused by a dose of Neosynephrine. No case developed respiratory difficulty or dyspnea. No fetal deaths occurred and the majority of the babies cried spontaneously and resuscitation was not necessary.

The postoperative complications and complaints of the patients were few and not serious. Backache, which occurred in 2 per cent of the cases, was mild and disappeared in four to five days. There were no postoperative respiratory complications.

Headaches occurred in 4 per cent of the cases. The usual analgesics were effective in controlling them. These were not considered the typical post-lumbar-puncture headache, inasmuch as they were not affected by postural changes. Urinary retention requiring catheterization was present in 5 per cent of the cases. Catheterization was required once in all except one patient who was catheterized three times.

DISCUSSION

Obviously the chief hazard in spinal

anesthesia for Cesarean section is the sudden, precipitous, severe hypotension encountered. The characteristics are the same as those seen in general surgery, namely, a comparatively marked reduction in systolic pressure, a slight reduction in diastolic and a reduced pulse pressure.

Severe as it was, the hypotension was overcome by vasopressor drugs, such as ephedrine and neosynephrine. Although the vasopressor may be administered prophylactically, it is preferable to administer it when needed and in the amounts required to produce the therapeutic effect. Prophylactically it is best administered intramuscularly and not subcutaneously, or, as is frequently done, in the interspinous ligament. It must be injected deep into the muscle tissue, long before the hypotension occurs, otherwise, it will not be absorbed. When the hypotension has ensued, the intravenous route is the only effective route.

Of particular interest is the elevation in blood pressure occurring immediately after the delivery of the fetus. As a rule, at the time of delivery of the baby, ergotrate and pitocin are administered. Whether or not this increase in blood pressure is due to the release of abdominal pressure with subsequent improvement of the venous return to the heart causing an increase in cardiac output, or to the administration of oxytoxics, is not easily answered. It is our feeling that the former explanation is more plausible. The rise does not occur in patients when inhalation anesthesia is employed, even though the same oxytoxics are administered. In some cases in which there was a delay of several minutes in giving the oxytoxics, the elevation in pressure appeared to coincide with the time of delivery. It is notable that there is a reduction in pulse rate with this elevation.

Fatalities from spinal anesthesia may be attributed to one of two causes: circulatory failure and respiratory failure. Respiratory failure results when the drug spreads along the thoracic and cervical roots in sufficient amounts to cause motor paralysis. The intercostal muscles and diaphragm are paralyzed and the patient dies from as-

phyxia. If recognized and immediately treated with artificial respiration until the effects of the drug "wear off", the outcome is favorable. Circulatory failure leads to a decrease in blood flow through the cerebrum, which is in turn followed by respiratory failure. Herein lies the answer to "What is the hazard of spinal anesthesia in Cesarean section?". From the foregoing cases, it is obvious that the degree of circulatory failure is quite pronounced, even in normal subjects free from circulatory complications. It comes on abruptly, is precipitous and fluctuates widely under the influence of vasopressors until delivery, at which time the blood pressure abruptly stabilizes. For some time it has been recognized that patients who have increased intra-abdominal pressure, such as seen when marked distention, large tumor masses or ascites are present, develop a serious degree of circulatory failure when spinal anesthesia is induced. Pregnant subjects respond in exactly the same manner. If one is not on hand to immediately institute therapy to combat this circulatory collapse the moment prodromal symptoms herald its approach, respiratory failure follows and the outcome is fatal. Patients who have been resuscitated and survived prolonged circulatory collapse have had permanent cerebral damage of varying degrees due to anoxia. In view of the suddenness and the severity of the circulatory depression, it is unwise for the obstetrician to attempt the dual role of operator and anesthetist. Another physician who is well acquainted with the physiological changes occurring during spinal anesthesia and who knows how to cope with them should stand by to devote his undivided attention to the patient during the early period of anesthesia. The fatalities reviewed all occurred when the operator assumed the aforementioned dual role. A vein should be cannulated, preferably before anesthesia is induced, to immediately introduce the vasopressor in the event it is needed. Fluids, though ineffective to overcome the hypotension, which is believed to be neurogenic, in origin may be needed

later if there is hemorrhage or shock. Unless these requirements can be fulfilled, it is best to select another type of anesthesia. The obstetrician who is compelled, because of circumstances, to act as operator and anesthetist, had better avoid spinal anesthesia for Cesarean section.

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THE USE OF A HISTAMINE ANTAGONIST IN INTRAVENOUS PYELOGRAPHY

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The advent of the technic of intravenous urography has provided a distinct advantage in studies of the upper urinary tract. The procedure consists of an intravenous injection of a contrast medium for purposes of roentgenographic visualization of the urinary tract. Unfortunately, the performance of intravenous urography is not entirely devoid of danger which becomes manifest as sensitivity reactions of variable degrees of severity and even sudden death. In an effort to guard against these undesirable reactions, this study has been conducted for the purpose of observing the value of a histamine antagonist drug as a prophylaxis against the sensitivity reactions following intravenous pyelography.

"Diodrast" N.N.R. or iodopyracet injection (the diethanolamine salt of 3,5-diiodo-4-pyridone-N-acetic acid) is one of the most widely used drugs employed for intravenous urography. The solution is of 35 per cent concentration, the iodine content being approximately 49 per cent. Other contrast media utilized in the visualization of the urinary tract include "diodrast compound solution" N.N.R., "skioldan" N.N.R., "hip-

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puran" N.N.R., "iopax" and "neo-iopax" N.N.R. Although these drugs differ in respect to chemical configuration, all of these substances contain iodine¹.

The various reactions to these drugs are presently believed to be due either to their iodine content or some other substance which is formed as a result of the introduction of these drugs into the body. The immediate reactions are arbitrarily classified as mild, moderate, severe, and fatal. The mild reaction usually begins with a tickling sensation in the throat followed by nausea; flushing of the upper half of the body may occur simultaneously or soon afterwards. The moderate reaction sometimes consists of nausea and vomiting; not infrequently, sneezing and generalized itching followed by urticaria occur. The onset of the severe reaction may make its appearance with some or all of the preceding complaints. Edema of the eyelids and lacrimation may occur first followed by laryngospasm, respiratory difficulty, vertigo, syncope, cyanosis and shock. Fatal reactions can occur after the injection of only a single cubic centimeter of the drug or within a few minutes after completion of the intravenous injection.

The realization of the potential hazards of intravenous urography makes it imperative that patients, who are being considered for this type of diagnostic procedure, should be investigated for the presence of sensitivity to the contrast media. Particular importance should be given to patients who have a history of allergic bronchial asthma, hay fever, hives, drug allergy, and seasonal allergic manifestations.

There are also available several simple tests for the determination of the individual's sensitivity to these drugs. An oral test has been described by Dolan² in which 2 c. c. of the drug is placed under the tongue of the patient. If there has been no reaction at the end of ten minutes, the patient is instructed to swallow the solution. If no reaction occurs at the end of thirty minutes, the test is regarded as negative. A positive reaction consists of a perioral numbness followed by a "funny feeling" in the tongue

which soon begins to feel thick and swollen and may even give the sensation of filling the entire mouth. A reliable and more rapid test has been described by Archer and Harris³ in which one drop of the drug is placed in the conjunctiva of one eye. Three to five minutes later, both eyes are examined. The occurrence of conjunctival irritation in the tested eye as compared to the control constitutes a positive reaction. An excellent test, which was introduced by Naterman⁴ and modified by others, consists of the intradermal injection of 0.05-0.1 c. c. of the drug with a control intradermal test below it. The sites are examined three to five minutes later. A positive reaction consists of the appearance of a wheal or area of erythema of about 1.5 cm. in diameter about the point of injection of the contrast agent.

The necessity for taking adequate precautions against these reactions has been emphasized in the medical literature many times. In a recent excellent report by Alyea and Haines⁵, 1,675 patients were studied for possible anaphylactic reactions who had previously received the intradermal test for sensitivity to "diodrast". The incidence of general reactions in this series was four times as high in patients who had positive intradermal tests as in those with negative cutaneous reactions. In their group of patients with allergic histories (i.e., bronchial asthma, drug sensitivity, etc.), the incidence of general reactions was 70 per cent in those patients with positive skin tests as contrasted with 13.6 per cent in those with negative intradermal test findings.

This is a report of the clinical experience with the use of a histamine antagonist in the preparation for intravenous pyelography of 22 patients, all of whom presented histories of allergic manifestations of one or more types. Each of these patients had positive conjunctiva and intradermal tests for sensitivity to "diodrast". The control group consists of 50 patients, all of whom had non-allergic histories and had negative

conjunctiva and intradermal sensitivity tests to "diodrast".

The rationale of using a histamine antagonist in this study was based on the encouraging reports of clinicians in the treatment and prevention of numerous allergic conditions. In view of the belief that the reactions following the intravenous injection of contrast media for intravenous pyelography is due to allergic phenomena, the use of a histamine antagonist was deemed worthy of a trial.

The routine employed in the preparation of these patients for intravenous urography is as follows:

1. On the day prior to the urographic study, a history of any of the clinical allergic manifestations is obtained. Conjunctiva and intradermal skin tests for sensitivity to "diodrast" are performed.

2. Nothing by mouth after the evening meal until the urographic studies are completed the following morning. (EXCEPTION: Par. 4.)

3. Purgation with castor oil at bedtime.

4. One hour before the pyelograms are to be made, the patient is given 50-100 mgm. (depending on size and age) of "pyribenzamine" (N,N-Dimethyl-N'-benzyl-N' (alpha-pyridyl) ethylenediamine monohydrochloride (Tripeleminamine). This drug is taken by mouth with one-half glass of water.

5. The contrast medium is injected intravenously in the following manner. One cubic centimeter is injected very slowly with a tuberculin syringe. Wait five minutes. If there is no reaction, complete the injection slowly with a constant eye on the patient. The appearance of any allergic manifestations is a signal for immediate discontinuation of the injection and the administration of epinephrine or ephedrine. The patient is observed thereafter until all evidence of danger has apparently disappeared.

The exclusive use of "pyribenzamine" in this series was not based on the belief that this drug is the best of the available histamine antagonists. The drug was employed

early in this investigation and its use was continued for the sake of being consistent.

The results obtained with the routine described above were as follows. No allergic reaction occurred in the control group. The incidence of allergic reactions to the intravenous injection of "diodrast" and the other contrast media is about 4 per cent in those patients who are non-allergic both in respect to history and sensitivity tests. Although it is possible that the histamine antagonist could have been an important contributing factor to the absence of allergic reactions in these patients, no definite conclusions can be fairly deduced from the findings of such a small series as comprised the control group in this study.

Of the patients in the allergic group in respect to history and sensitivity tests, 4 patients, or 18.2 per cent, developed general sensitivity reactions. One of these 4 patients began to vomit after the intravenous injection of 0.5 c. c. of the drug. Another patient became flushed about the head and neck and developed intolerable itching after 12 c. c. of the drug was injected. The injections were discontinued in both of these cases. The other 2 patients developed urticaria and itching almost immediately following the completion of the injections. All of the patients responded well to adrenalin, 5 minims, by hypodermic injections; 100 mgm. of "pyribenzamine" was administered orally as soon as the patient was made comfortable. There were no fatalities.

CONCLUSIONS

A histamine antagonist was utilized in the preparation of patients for intravenous pyelography. The appreciable diminution in sensitivity reactions in those patients who possess various allergic disorders and manifest positive reactions to the sensitivity tests to the contrast media justifies continued use of this technic.

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CORNEAL TRANSPLANTATION*

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KERATOPLASTY

The history of keratoplasty which had its beginning in 1789 when Pellier first attempted the construction of an artificial cornea made out of glass with a supporting ring of silver is replete with interesting experiments and observations up to the present time. Some of the highlights of this era should be mentioned.

1. Reisinger—1818—transplanted cornea to replace opaque cornea. The idea originated with Himby who suggested it in 1813. Reisinger in his paper in 1824, the first of its kind to appear in print, also named the operation keratoplasty.

2. Thane—1834—total corneal transplantation.

3. Stilling—1836—suggested using only a piece of the cornea corresponding in size to the pupil.

4. Koenigshoefer—1840—first to suggest double-bladed knife; used two Beers knives joined together; also the first to use cadaver transplant.

5. Markus—1841—first to formulate the conditions necessary for a successful operation: (1) exact fit as to size and shape of transplant, (2) speedy transportation of the transplant from donor to host, (3) avoidance of the crystalline lens and the vitreous humor, (4) fixation of the transplant. Used gold clips to fix transplant in place of sutures.

6. Steinberg—1843—devised a trephine-shaped instrument 8 mm in diameter.

7. Desmarres—1843—mentioned possibilities of heteroplasty; felt that hosts's

cornea gradually replaced the donor graft.

8. Malhagn—1845—first to suggest keratectomy.

9. Nussbaum—1856—insertion of a crystal-shaped stud into leucoma which had first been incised.

10. Piltz—1859—tried using glass in place of corneal tissue.

11. von Hippel—1877—trephine—used both penetrating and non-penetrating methods; got his best results in non-penetrating grafts.

12. Zirm—1905—brilliant result in one case brought about a renewed interest in the subject; used a partial penetrating method in a man with bilateral leucomata as a result of lime burn. Vision of 0.1 was obtained in one eye, the other eye was lost from glaucoma. A five year follow-up was kept on this patient.

13. Plange—1908—Auto-transplant.

14. Elsching—1908-1930—203 operations performed with an average of 73 per cent takes; 20 per cent had excellent visual results.

SELECTION OF CASES FOR CORNEAL TRANSPLANTATION

No general rule may be applied for the selection of cases favorable for corneal transplantation. Each case must be dealt with individually, and a general appraisal made. In studying the patient's eye condition, the following factors must be taken into consideration.

Environmental Factors—What are the indications and need for the operation? A patient with reduced vision as a result of a scarred cornea and who is well adjusted to his environment and is self-supporting, might better be left alone, even though the corrected vision is below 20/200. This is especially true if the eye falls into that group of cases which is designated as doubtful for the improvement of vision. This group of cases will be dealt with in more detail later on. The ophthalmologist should be especially guarded in giving advice to one-eyed patients.

The physical condition and age of the patient is an important factor, as in other types of intraocular surgery. This exami-

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nation should include a medical survey such as is usual preliminary to cataract operations. Some knowledge of the patient's psychological make-up should also be known. Highly nervous and poorly emotionally adjusted persons make especially poor candidates for this type of ocular surgery.

Age Group—Another important factor to remember is that corneal grafting cases belong to a much lower age group than do cataract patients. A failure following a cataract operation does not lead to quite as serious consequences from an emotional and economic point of view. Most cataract patients have reached the retiring age and do not look forward to a very active life. Successful operations have been performed on babies as well as people in their seventies and eighties. Transplantation in the very young is to be avoided because of the difficulty in dressing and the greater danger of infections. Dressings have to be done under general anesthesia, and the danger from sudden and violent movement during the early post-operative stages might possibly cause a dislodgment of the graft from its bed.

Unfortunate newspaper dramatization of this type of surgery makes it more difficult for the surgeon in many instances to select proper cases for operation. Great pressure is often brought to bear on the surgeon by the patient's family and interested groups or individuals to do something, when the surgeon's better judgment tells him not to. Many patients travel great distances in the vain hope of being operated upon, when their local doctor could have prevented useless expense.

Iridectomy—No case of scarred cornea should be operated upon if an iridectomy would bring about an improvement in vision. Just how much improvement in vision should be obtained by an iridectomy must be left up to the patient to decide. The greater risk of performing a corneal transplanting operation should be explained to him. Before making this decision it is well to see how much improvement in vision may be obtained by dilating the pupil. If there

is material improvement in vision, there can be no question that an optical iridectomy should be performed. In doubtful cases there is no disadvantage in first doing an iridectomy. If there is no improvement in sight, a transplant may be performed subsequently. If the cornea is so densely scarred that the pupil cannot be seen, transillumination should always be done, and an accurate idea obtained as to the size and shape of the pupil.

CLASSIFICATION OF CASES FOR OPERATION

1. Favorable for improvement of vision.
2. Partially favorable for improvement of vision.
3. Unfavorable for improvement of vision.
4. For cosmetic improvement.
5. For treatment of descemetocoele.
6. Where preliminary surgery or treatment is necessary before final opinion may be given.

The most favorable cases are those in which there is a nebulous type of opacity, quite central, and in an otherwise normal eye. There must be no active corneal disease present, or active infection, of the conjunctiva, sclera, or uveal tract. There must be no increased intraocular tension, and no vascularization of the cornea. Blood staining of the cornea and conical cornea are usually favorable cases.

Conical Cornea—A very definite policy in the selection of conical cornea cases should be followed. At our clinic no patient is operated upon if the visual improvement with correction is better than 20/200 in either one or both eyes. This also includes those cases in which vision can only be improved by means of a contact glass. An exception is made in those patients that do not tolerate the wearing of contact lenses, in whom there has been a rapid deterioration of vision due to the development of central corneal opacities. It would seem more advisable to operate on these patients early and do as large a graft as seems feasible. It is interesting to note that the contact glass, if necessary for the improvement of vision, though not well tolerated before

the operation, may usually be worn with comfort after operation.

Partially favorable cases include those in which there is some corneal vascularization present such as in old cases of interstitial keratitis, and where the opacity, though central, is not too dense, and with only a small amount of clear cornea surrounding it.

Cases of adherent leucoma do not do well as a rule, unless the adhesions are first destroyed by a preliminary operation or irradiation. Extreme shallowness of the anterior chamber adds little to the technical difficulties of the operation, though there may be greater danger of anterior synechiae forming after the operation.

The diagnosis of glaucoma in the presence of kerectasia or keratoconus is most difficult to make. Its presence should always be suspected. A Baillart type of tonometer may be helpful, as with this instrument the degree of scleral rather than corneal indentation is measured. If there is any doubt concerning the diagnosis of glaucoma, an attempt should first be made to lower the intraocular tension by one of the filtering types of operation.

Corneal Dystrophy—Most cases of corneal dystrophy are not favorable for corneal transplantation. This is especially true of the Fuchs' endothelial and epithelial types of dystrophy. From present knowledge it would appear advisable to operate early in the course of the disease when the opacification of the cornea is not too dense and does not include all the layers of the cornea. Salzmann's¹ corneal dystrophy usually has some blood vessels present, but if these vessels can first be destroyed by irradiation, the transplant should be attempted on one eye, if the other eye has useful vision. Groenouw's² dystrophy appears to give a more favorable result. Here again it is a question of degree and density of the opacification of the cornea. Some cases of fatty or lipid degeneration of the cornea may be favorable for operation. Calcareous degeneration, if it involves the entire cornea and the full thickness of the cornea, should not be operated upon. However, if the de-

generation is band-shaped and not too dense, with some clear corneal tissue surrounding the scarred area, corneal transplantation should be performed.

Unfavorable for improvement of vision are cases with marked nystagmus as these eyes are amblyopic, and though a clear graft may be obtained, the visual results are disappointing. Densely scarred corneas from powder burns do poorly following transplantation. The same applies to lime burns of the cornea, but only if all the layers of the cornea are involved. Any eye which is hypersensitive to light trauma such as measurement of intraocular tension should not be operated upon until the cause of the hypersensitivity is discovered. Little experience has been had in operating on old trachomatous eyes, but the general principles laid down concerning degree of vascularization and opacification would hold in the selection of these cases for operation.

For Cosmetic Improvement—Many cases where tattooing was formerly resorted to in order to hide a disfiguring scar might be improved by corneal transplantation. In some few cases an improvement of vision may be obtained though this is not the general rule, due to many complicating factors. In general, tattooing and corneal transplantation do badly in the presence of a highly vascularized cornea.

For Treatment of Descemetocoele—There is perhaps no more favorable treatment of this condition than corneal transplantation. Cauterization and repeated paracentesis are usually palliative measures. Conjunctival flaps only add to the disfigurement of the patient's eye, and often the flap becomes incarcerated in the wound. Transplantation should not however be attempted if there is a markedly increased tension, or in the presence of large corneal blood vessels. The degree of vascularization should be one of the most important and determining factors.

Where there is extensive vascularization of the cornea preliminary radiation (Iliff)³ should be performed, and unless all the larger vessels are completely destroyed, keratoplasty is bound to meet with failure.

It is true, however, that in a few cases where smaller blood vessels have been present before operation, after the transplant operation has been done, the vessels will grow to the edge of the graft and tend to extend along the scarred area without actually penetrating into the graft itself. Apparently the scarred tissue formed in the cornea following a transplant operation will act as a barrier in some cases, but it is not wise for the surgeon to depend on this as there is no way of predicting whether the vessels will penetrate into the graft or not.

It is not always necessary to do preliminary surgery for anterior synechiae if they are small and of delicate structure, as these can be attended to at the time of operation. It is poor surgical judgment to operate on any eye in which there is an active uveitis present, but it is an interesting fact that several have been operated upon and that immediately after the operation a recurrence of a previously active uveitis was noticed with large KP deposits noted on the posterior surface of the graft. All these patients made uneventful recovery and the KP deposits have since disappeared. One has been followed for a period of three years with no recurrence of the uveitis, and the transplant has remained clear.

Therapeutic Keratoplasty—I have had no experience with therapeutic keratoplasty but many references have appeared in literature. Feldman⁴, Shartz⁵, and Filatov⁶ advocate a partial penetrating keratoplasty for such conditions as serpent ulcer and tubercular interstitial keratitis. It does not appear to me, however, that this form of treatment is advisable. Inactive cases of interstitial keratitis do well in the absence of large corneal blood vessels.

Partial Non-penetrating Keratoplasty—Very little has appeared in English literature concerning partial non-penetrating keratoplasty but from foreign reports it would appear that the results of this method are nearly as good as results from a penetrating type of keratoplasty. It may be that this method may eliminate the need for keratectomy in many instances. It is not

the purpose of this presentation to discuss this subject.

OPERATIVE TECHNIQUE

After more than ten years' experience in doing corneal transplantation, during which time several hundred cases have been operated upon, the following observations may be of some interest. Partial penetrating keratoplasty may be performed by the use of:

a) Stencils to outline the window,

b) A double-bladed knife as first suggested by Koenigshoefer in 1840, or

c) The trephine method as originally suggested by Steinberg in 1843.

The trephine method offers several advantages over the square window:

1) Better cosmetic result.

2) Outline of window made easier because of adjustable stop on trephine.

3) Adjustable stop also prevents trephine from becoming dulled during sterilization.

4) Donor window is cut through completely with trephine, eliminating use of scissors and unnecessary manipulation of donor graft.

5) Specially curved scissors used to complete cutting of window in host's eye more easily manipulated than the straight scissors used in the square graft.

The steps in the operation:

a) *Donor eye*—the eye is brought to the operating room from the Eye Bank in a moist chamber. The Eye Bank only sends eyes which have been carefully selected for this type of operation. If there is any question about the condition of the eye, especially the condition of the cornea, this report is given the surgeon before the operation. The age, sex, color, cause of death, etc. of the donor must always be reported to the surgeon operating. He has the final choice of whether the donor cornea is in good condition and on his shoulders rests the responsibility of the outcome of the operation. Eyes of still-born are unfavorable as the tissues are too malleable and delicate and there appears to be more edema of the graft following operation. The upper age limit is not exactly known, as the

eyes of people in their sixties have been used with favorable results. Gliomatous eyes should not be used as there may be a deposit of cells on the posterior surface of the cornea. Eyes with tumors may be used if the tumor is confined to the posterior segment. As a general rule, glaucomatous eyes are not favorable donor material as there is frequently a bedewing and edema of the endothelial surface. Any eye with intraocular infection should not be used even though the cornea may clear.

b) *The graft* may first be cut from the donor eye while the assistant prepares the patient as for a cataract operation. The donor eye is removed from the sterile glass moist chamber and held in one hand, using a piece of gauze wrapped about the eye to keep it from slipping while the window is being cut. The trephine must be exceedingly sharp and should have been previously tested by the surgeon before giving it to the operating room nurse for sterilization. The surgeon holds the donor eye in one hand, places the cutting edge of the trephine on the cornea, being careful to get it exactly centered, and with several quick rotations of the trephine cuts a complete window. To assure rapid and complete penetration, slight pressure should be put on the donor eye with the fingers of the other hand. As the trephine is rotated, the surgeon makes sure of complete penetration throughout the 360° of the arc, even at the risk of destroying the iris and lens of the donor eye. Very frequently the donor window impinges on the inside of the trephine and considerable manipulation may be necessary to dislodge it. With the use of a stilette or plunger made to fit the inside bore diameter of the trephine, the cut window may be dislodged without injury to its endothelial surface. The window when removed is placed on a fenestrated spatula, endothelial surface uppermost, and set aside while the recipient's eye is prepared. It has not been thought advisable to place the donor window in saline solution, but preferably in a moist chamber as the saline tends to produce edema of the graft, and

perhaps lead to certain complications later on.

c) *Preparation of the recipient's eye*—After the usual pre-operative preparation, sedation, lid block, etc., a retrobulbar injection may be given if the intra-ocular tension is elevated. As a general rule, it is easier not to operate on too soft an eye. The trephine does not bite into the corneal tissue as readily, and considerable pressure must be exerted by the surgeon before penetration is obtained. Since the development of a trephine with an adjustable guard, this danger is not quite as great, but the facts mentioned should be kept in mind.

d) When a sufficient depth on anesthesia has been obtained, the window is outlined using the same trephine that was used in obtaining the donor window, but the guard, instead of being set at any depth over 2 mm. is now set at a depth of $\frac{1}{2}$ mm. or less. This is done in order to prevent penetration into the anterior chamber before sutures have been properly placed in position.

e) Fluoresceine is dropped on the cornea to further accentuate the outline of the window.

f) Two figure-of-eight sutures D&G 7-0, one black and one white, are placed in position. Each bite should be taken close to the outlined window as possible, the average distance being about 1 mm. The needles should not perforate more than the anterior third of the cornea and the bite should not be over 3 mm. in length with each suture employed.

g) A central traction suture is next placed through the superficial layers and tied, and the ends cut short.

h) Cutting of the window is completed after the sutures have been laid aside. The exact amount of penetration is judged by a movement of the iris, or a sudden gush of aqueous fluid. If observation of these two factors are remembered, it is rare indeed that injury to the iris or lens occurs. It is too hazardous to attempt cutting a complete window with a trephine as has been

suggested when using the Green automatic trephine.

i) Once perforation has been made along one border, specially made curved scissors are used to complete cutting the window. To facilitate this procedure the previously placed central suture may be grasped with iris forceps and traction made at the point where needed. In cutting the window, even though the scissors have the exact radius of curvature of the trephine, an attempt should be made to cut slightly beyond the outline made. This allows for the thickness of the jaws of the scissors and leads to a more perfect fit.

j) Atropine 3 per cent is instilled through the open window when the button has been completely excised. The previously prepared donor graft is placed in position and the sutures securely tied.

Post-operative Care—The first dressing is performed forty-eight hours after operation. Atropine and Metaphen 1:2500 aqueous solution are employed. Daily dressings after that. The pupil is kept well dilated with mydriatic, and penicillin ointment is used after the first dressing in place of Metaphen drops. Sutures are removed on the tenth day, or later, depending on whether suture is cutting into graft or whether there is a beginning stitch abscess. If anterior synechiae develop, these should be treated before the patient leaves the hospital in most instances.

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DITHIOPROPANOL (BAL) IN THE TREATMENT OF BICHLORIDE POISONING

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Since the American and British governments have released information on BAL

British Anti-Lewisite) (dithiopropanol), its efficacy in the treatment of arsenical poisoning has become well known. Recently, I had the opportunity to observe its effects in bichloride of mercury poisoning. That one case is no basis for a conclusive report is realized; however, this case is intended to signal out the possible use of the drug in the treatment of a heavy metal poisoning other than arsenic.

It will be of interest to review what occurs when bichloride of mercury is ingested. It is most injurious when ingested completely dissolved on an empty stomach. When swallowed in tablet form, it is least harmful, for the tablet is rushed along the intestinal tract at a rapid rate and absorption is slow.

The bichloride of mercury passes into the blood stream and is deposited in the various organs, ultimately in the kidneys where the greater part of the damage is done to the tubules. These structures show signs of degeneration and obstruction. A tubular type of nephritis develops and the result is the failure to excrete urine, which means the retention of nitrogenous waste and excessive water.

It is known that not all units of the kidneys function simultaneously, and each day some percentage of them comes into play. The number that are called upon may well be in proportion to that particular moment's need. For instance, if the nitrogenous waste is excessive, more units may be called upon to keep the non-protein nitrogen at a constant. Therefore, at the time the poison is ingested, only those tubules functioning are damaged, but as the poison is being picked up by the blood stream and presented to the kidneys for excretion, there results a continuous stream of tubular pathology. If something should be done early to neutralize the bichloride of mercury in the tissues and blood stream, then the tubular damage would cease. If the neutralizer were given immediately after ingestion, very little damage of the kidneys should result. However, if the poison is not combatted early, it is evident that the kidney damage will increase progressively

each day. With the increase of waste products, the body calls upon a greater number of units to function, thus rapidly eradicating the kidney units.

CASE REPORT

A white female, aged 24, ingested ten capsules of nembutal (15 grains). On an empty stomach, the following day, she took two tablets ($7\frac{1}{2}$ grains each) of bichloride of mercury dissolved in a glass of water. Due to severe pain along the upper digestive tract, she was forced to call for assistance; the number of hours lapsing between the administration of the drug and the arrival of assistance is not known. She was admitted to a hospital. By means of gastric tube, egg albumin and milk were introduced into the stomach. The patient began to vomit; none of the blue coloring was seen. Six hours after admission, the vomitus contained blood and necrotic material. With each attack of vomiting, there was a bowel movement, blood frequently appearing in the stool. Continuous type of vomiting persisted for about 36 hours, during which time she was given two liters of normal saline intravenously. In spite of receiving no fluids by mouth, she would bring up from 200 to 300 c.c. of fluid with each vomiting seizure. When the vomiting showed signs of subsiding, she was given 5 per cent glucose in distilled water, which had to be discontinued when evidence of edema of the face and neck appeared.

On the second day, the patient had violent attacks of hiccoughs, and there was pain upon swallowing. Thereafter, the mouth and throat were a constant source of pain. The mucous membrane of the gums showed signs of large areas of erosion. The gums were bleeding and presented deposits of mercury. On the fourth day, the patient was given an infusion of 5 per cent glucose in distilled water. Immediately thereafter, she began to have tachycardia and difficulty on respiration, drowsiness and blurred vision. Her general condition was bad. During these four days, she did not void. One-half ounce of urine was obtained by catheter on the fourth day. The patient was then wrapped in rubber sheets, about which were placed hot, wet blankets and hot water blankets for 30 minutes. During this time, she perspired profusely and her condition improved for a few hours. The next morning BAL was obtained and she received 1.2 c.c. intramuscularly and four hours later, a similar dose. Her condition began to improve and she felt better; the mental cloudiness was lost and she no longer heard voices. The mouth soreness improved and vomiting and diarrhea subsided to one or two attacks per day. She began to void within a few hours one-half ounce amounts at frequent intervals. She was able to retain water and soft drinks. The edema about the face began to subside. The BAL was given every four hours for six doses. Fifteen to 20 minutes after the third and succes-

sive doses of BAL, she experienced burning of all the membranous surfaces of the body, nausea with profuse salivation and a sensation of constriction of the chest, all of which lasted not more than 30 minutes. The amount required to produce these symptoms was smaller with each consecutive dose. This patient finally became uncomfortable with 0.5 c.c. dose. After the six consecutive doses at four hour intervals, she was given one daily for two days. By the third day of administering BAL, she was voiding an ounce or more every few hours. Prior to her discharge from the hospital, her NPN rose to 225 mg. and creatinin to 13.9 mg. per cent. She was discharged from the hospital three days after the BAL was administered and seven days after admission. Four weeks after being hospitalized, her NPN was 35, creatinin was 1.5 mg. per cent and PSP was 60 per cent.

DISCUSSION

This patient had ingested bichloride of mercury in its most lethal preparation. She developed an acute anuria that lasted three days, the NPN rose to 225 on the third day, the creatinin to 13.9. She had an encephalitis apparently due to mercury poisoning, also a myocarditis as demonstrated by a pulse irregular in rhythm and force and accompanied by a precordial heaving. All of these findings disappeared with the administration of BAL. Although the chemistry was the same, the patient had a sense of well being and mental clarity; the voices she had heard had disappeared. The soreness of the mouth and throat improved. The deposits of mercury along the gum edges and the bleeding of the gums subsided. The vomitus showed less clotted blood and other necrotic materials. The bowel movements became normal on the second day of treatment.

It appears that the administration of fluids in these patients should be guarded with every factor of safety. In the beginning, when the vomiting was frequent, the replacement of fluid and chlorides was indicated for this patient, but when it stopped and the patient was retaining fluids, they would, if pushed, have definitely killed her. The heart was already toxic and the throwing on of an extra load would have been dangerous. The presence of an excessive amount of fluids in the tissues is sufficient stimulus for the kidneys to rid the body of this accumulation. The fact that these in-

dividuals who recover have good to excellent kidney function indicated that only a small number of the functioning units are destroyed. Because of the response to BAL in this case, it would seem that if this patient had received BAL on admission instead of the fourth day, she would have given little cause for anxiety.

Due to the gravity of the patient's condition, dental hygiene was neglected and she developed a serious Vincent's angina. In all cases of this kind, a dentist should be consulted as soon as oral complications appear so as to prevent permanent dental damage

NITROGEN MUSTARD THERAPY*

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AND

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The chemistry, biological actions, and history of the nitrogen and sulphur mustards have been amply discussed in an article by Gilman and Philips in *Science* of April 1946. The nitrogen and sulphur mustards owe their physiological activity to a chemical reaction which takes place when they are put in aqueous solution. Under these circumstances an intramolecular cyclization occurs with the formation of an active cation, ethylenimonium in the case of the B-chloroethyl amines. The ethylenimonium ion has great affinity for many functional groups of compounds of biological importance, such as the sulphide, phenolic, and E-amino groups of amino acids and peptides.

The ability to cause the death of cells is the outstanding property of the nitrogen mustards. It is not known just how this action takes place, but it is thought that inactivation of enzyme systems with the production of irreversible metabolic defects in the cells may be the mode of action. Another explanation is that the drugs are specifically nucleotoxic. Susceptibility of cells

to the action of the nitrogen mustards is directly related to the degree of proliferative activity; hence, tumor cells, lymphatic tissue, bone marrow, and gastrointestinal mucosa are especially susceptible. When these halogenated alkylamines are given in large doses to experimental animals, the normal tissues mentioned and transplanted tumors show evidence of the marked destructive activity of the drugs. Complete aplasia of the bone marrow may be produced in this manner. The biological effects of the nitrogen mustards resemble in many ways those of roentgen rays. Indeed, it has been suggested by Hardin B. Jones, in the *American Journal of Roentgenology and Radium Therapy* of July, 1947, "that perhaps the neoplastic inhibiting mechanism associated with tissue irradiation is a chemical substance and is not due to tissue ionization directly." It has been shown that a number of the delayed effects of irradiation can be duplicated by toxic chemicals as, for example, the anemia in benzol poisoning.

As a general statement, it may be said that nitrogen mustard therapy has not proved superior to the x-ray in the treatment of lymphomas and leukemias. Its optimal therapeutic benefits have been observed in Hodgkin's disease. It has been suggested that nitrogen mustards be used to treat patients with lymphomas that have become radio-resistant, as a response can be anticipated in a large number of these patients. It has been observed that cases which have become resistant to roentgen therapy may, after a course of methyl bis B-chloroethyl amine, again become radio-sensitive. The exact importance of the nitrogen mustards and their relation to radioactive substances and x-rays is not yet fully determined.

DOSAGE AND MODE OF USE

An optimum therapeutic dose of (methyl bis) nitrogen mustard has been tentatively established as being .1 mg./kg. of body weight. Four such doses constitute the average course of treatment. These are given usually, but not necessarily, on consecutive days. In carefully selected cases the calculated daily dose has been given for

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as many as six to eight days. The drug is given by the intravenous route only. Nitrogen mustard is supplied by Merck & Co. in sealed bottles, each containing 10 mg. of the crystalline product. This is diluted with 10 cc. of normal saline, the proper dose withdrawn, and injected without delay into the tubing of a freely flowing saline infusion. The activity of the compound is rapidly dissipated after it has been dissolved. The injection may be made as rapidly as desired. We have noted no immediate reactions during administration of the drug; phlebothrombosis was encountered once at the site of injection. Patients receiving initial treatment should be hospitalized for the four days of therapy. Repeat doses, as reported by Jacobson, Spurr *et al.* in *Medical Clinics of North America*, January, 1947, may be given as an out-patient procedure.

Subsequent courses of treatment may be considered when the patient has recovered from the delayed toxic manifestation of the preceding treatment, particularly the hematopoietic depression. The time factor involved varies considerably and may be from two weeks to two months.

TOXICITY

The skin and eyes can be damaged by contact with the nitrogen mustards. Precautions should be taken to avoid any possible exposure. Local tissue necrosis may occur if the injection extravasates. Thrombophlebitis may develop at the site of injection, but this complication practically never occurs if the technique of administration previously described is used. Nausea and vomiting frequently follow each dose of the drug within a period of thirty minutes to three hours. A long-acting barbiturate given prior to the injection decreases the severity of these symptoms. Some of our patients experienced vomiting only with the first dose of the drug; one patient did not vomit at all. Anorexia develops in many of the patients, but disappears in one or two days.

The most important toxic action which confronts the clinician is the depression of the blood forming organs which occurs in all cases. However, an adequate clinical re-

sponse can be obtained without affecting the formed elements of the blood seriously, if care is taken with the dosage. Lymphopenia is a characteristic reaction to the therapeutic exhibition of methyl bis (B-chloroethyl) amine. This develops within the first two days following treatment, and generally begins to subside during the second week. A granulocytopenia develops in the third week, generally persisting for about one week. There is a variable degree of thrombocytopenia during the first three weeks. Petechiae have been noted only occasionally. Mild reduction in the erythrocyte count is also observed, reaching its peak in about three weeks, but frequently a preëxisting anemia will improve as a result of the effect of the nitrogen mustards on the disease process. The chronological sequence of the changes in the peripheral blood parallels closely the changes which occur in the bone marrow. Repeated laboratory tests on the urine, renal function, hepatic function and blood chemistries have not revealed any toxic action; patients with known kidney and liver damage have been treated with repeated courses of nitrogen mustards without evidence of further impairment of function. It is interesting to note that infection rarely complicates the granulocytopenia observed in nitrogen mustard therapy.

DISEASES TREATED AND POSSIBLE VALUE

Since the first reported clinical use of the nitrogen mustards by Gilman, Goodman and others in *Science*, April, 1946, numerous reports have appeared on the use of these drugs in the treatment of neoplastic diseases. It seems to be generally agreed that the best results have been obtained in the treatment of Hodgkin's disease.

We will attempt to give a brief and tentative evaluation of the nitrogen mustards in the therapy of the lymphomas, leukemias, and allied disorders. Impressions of the therapeutic value of these drugs in a variety of neoplasms will be mentioned. These impressions are derived principally from a recent preliminary report of the National Research Council.

Hodgkin's Disease. A palliative response to nitrogen mustard is the rule in Hodgkin's

disease. The therapeutic effects noted are: marked diminution in the size of enlarged nodes, both peripheral and mediastinal, frequent decrease in the size of an enlarged liver or spleen, and a normal temperature in those patients exhibiting fever as a sign of the disease. An improvement in the appetite is consistently noted and feeling of well-being of the patient. The expected duration of remission after a course of therapy varies from one to five months. Remissions have been produced for as long as four years by treatment given at intervals of one to two months. Remissions thus effected appear to become of shorter duration with successive courses of the drug. At the date of writing no definite conclusion has been reached as to the comparative values of nitrogen mustards and irradiation in the treatment of Hodgkin's disease.

Lymphosarcoma. Beneficial effects of nitrogen mustard therapy are seen in lymphosarcoma but objective and constant features of the response are much less striking than are noted in Hodgkin's disease. The rapidity of response to treatment varies greatly. Duration of remission varies from none to eight months. In a case reported by Jacobson, Spurr *et al* in the J.A.M.A. of October 5, 1947, clinical remissions lasting up to eighteen months were noted. Therapeutic benefits are qualitatively similar to those seen in Hodgkin's disease. Remissions have been produced for as long as thirty-six months in 2 patients.

Polycythemia Vera. A few cases of polycythemia vera have been reported. The response to treatment has been favorable with clinical remissions lasting from three to seventeen months. More experience with the use of the nitrogen mustards in this disease will be necessary before a comparison can be made with other methods of treatment.

Chronic Myelogenous and Chronic Lymphatic Leukemia. Response to nitrogen mustard therapy in these conditions is noted mainly in a reduction of the white cell count, an increase in platelet count when thrombocytopenia exists, and frequently a reduction in size of an enlarged

liver or spleen. Of the two conditions the response of patients with chronic lymphatic leukemia is more favorable. Therapeutic effects noted have been similar to the response seen in irradiation therapy of these diseases.

Acute Leukemias. There has been reported no evidence of therapeutic response in acute leukemias, and the use of the nitrogen mustards in these diseases is not encouraged.

Miscellaneous. Reports from investigators through the National Research Council indicate that nitrogen mustards have been used in cases of carcinoma of the lung, mycosis fungoides, multiple myeloma, head and neck tumors, carcinoma of the gastrointestinal tract, carcinoma of the breast, carcinoma of the cervix and uterus, genitourinary tumors, bone tumors, nervous system tumors, melanosarcoma, and miscellaneous conditions. There has been a wide variation in response of individual tumors within these groups. There have been no apparent cures reported to date. A palliative therapeutic response has generally been noted in mycosis fungoides, neuroblastoma, and to a lesser extent in carcinoma of the lung. Isolated and occasionally quite favorable responses have been noted in adenocarcinoma of the gastro-intestinal tract, embryonal tumors of the genitourinary tract, fibrosarcoma, and carcinoma of the breast. It is suggested by the National Research Council that further clinical trials may be carried out on the use of the nitrogen mustards in the palliative treatment of metastatic malignant melanoma.

CASE REPORTS

We have treated 11 patients with the methyl-bis compound. The cardinal points of these cases are presented in table form (Table I). Detailed case reports have been forwarded to the National Research Council and will be used in the comprehensive study of the nitrogen mustards. Sixteen additional cases have been treated but the data is incomplete on these.

HISTOPATHOLOGICAL CHANGES NOTED IMMEDIATELY FOLLOWING TREATMENT

As stated previously, the effects of the nitrogen mustards on tissues are similar to

SUMMARY OF 11 CASES TREATED WITH METHYL-BIS (B-CHLOROETHYLAMINE) HCl (NITROGEN MUSTARD)

PATIENT AND DISEASE	PREVIOUS TREATMENT	DURATION SYMPTOMS	IMMEDIATE THERAPEUTIC RESPONSE	FIRST REMISSION	IMMEDIATE TOXIC EFFECTS	MAXIMUM LEUKOPENIA	SUBSEQUENT TREATMENTS	(AV. DUR.) SUBSEQUENT REMISSIONS
No. 1, WF, age 43 Hodgkin's disease	X-ray, 1 course	6 mo.	Decrease size lymph nodes, felt well, afebrile	10 wks.	Nausea & vomiting, mod., all treatments	2,950	Two	2 mo.
No. 2, WM, age 33 Hodgkin's disease	None	3 mo.	Decrease size lymph nodes, liver, spleen; decrease temperature	12 wks.	Mild nausea & vomiting	1,500	One	2 mo.
No. 3, WM, age 52 Hodgkin's disease	X-ray, 1 course	6 mo.	Decrease size lymph nodes; symptomatic improvement	4 wks.	Slight nausea	2,000	One	In remission
No. 4, CF, age 37 Lymphosarcoma	None	1 mo.	Decrease size lymph nodes, liver, spleen; sympt. improvement	2 wks.	None	2,300	None	
No. 5, CM, age 12 Lymphosarcoma	None	1 mo.	None	None	Mod. nausea & vomiting	4,400	None	
No. 6, WF, age 59 Chr. m. leukemia	None	6½ mo.	Sympt. improvement. Reduction total WBC.	8 wks.	Mod. nausea & vomiting		Two	3 wks.
No. 7, CM, age 4 Lymphoblastic leukemia	None	9 days	Marked reduction in total WBC.	1 wk.	Mild nausea & vomiting	1,500	None	
No. 8, WM, age 2 Wilm's tumor	X-ray, Surgery	9 mo.	None	None	None	4,000	None	
No. 9, WF, age 58 Ca. of esophagus	None	4 mo.	None	None	Mod. nausea & vomiting	unrecorded	None	
No. 10, CF, age 25 Fibrosarcoma, metast. lung	None	11 mo.	Slight decrease in dyspnea	Treat. too recent to evaluate	Slight nausea & vomiting	None	None	
*No. 11, WF, age 21 Lymphoepithelioma metastatic	X-ray, Radium	2 mo.	Decrease liver size, sympt. improvement, decrease in fever	12 wks.	Nausea & vomiting, anorexia	3,000	Three	3 wks.

* See case report.

those of x-ray. The following study shows the similarity of the tissue response. Apparently the changes take place in a somewhat shorter period of time with the nitrogen mustards. The microscopic studies presented are from lymph nodes from a case of lymphosarcoma (case no. 4). Late histopathological changes have also been found to be similar to those seen in x-ray therapy.

*Lymph Node before
Therapy (2-15-47)*

Capsule—Thin, no invasion of tumor.

Peripheral Sinus—Retained 2 areas, loose, filled with edema fluid, lymphocytes and few large mononuclear cells, some with 2 nuclei. Nonphagocytic.

Architecture—All lymph follicles replaced by fairly large lymphoblastic cells (12-30 micra) in various stages of mitotic division with both typical and atypical multipolar mitoses. Essential cell contains large oval to rounded vesicular nucleus with prominent single to double nucleoli and very loose chromatin strands. Nuclear membrane distinct, cytoplasm scanty and basophilic with an ill-defined cytoplasmic membrane. No eosinophils. Fair number of mature lymphs present. No areas of necrosis. Reticulum stroma poorly defined. Intermediary sinuses replaced by tumor cells. Fair number small vessels present, lined by hyperplastic endothelium. Evidence of phagocytosis meager.

*Lymph Node after
Therapy (2-19-47)*

Capsule—Slight fibrous thickening with infiltration by tumor cells and lymphocytes in two areas.

Peripheral Sinus—Retained and appear dilated; contain numerous tumor cells, few lymphocytes. No evidence of mitotic division but no phagocytosis.

Architecture—All lymph follicles replaced by larger tumor cells (18-40 micra) which appear to rest on a reticulum, have larger, more distinct cytoplasm with essentially the same type nucleus seen before treatment. Some of these cells are very large, up to approximately (60-80 micra), and contain eosinophilic, finely granular cytoplasmic masses, and some show phagocytosis of nuclear debris. Areas of necrosis, surrounded by these large cells with eosinophilic cytoplasm masses are seen in the region of primary lymph follicles. Some hemorrhage and dilatation of the sinusoids is apparent in these areas. Numerous bizarre mitoses are seen. No eosinophils present. Vessels appear more numerous and congested. Reticulum definitely increased.

Note: Resembles node seen following irradiation.

A case of metastatic lymphoepithelioma is presented. The tumor was very sensitive to the action of the methyl-bis compound. A rather striking palliative response followed the first three courses of therapy. The patient's discomfort was relieved considerably by the antipyretic effect of the drug and the reduction in the size of the liver.

CASE REPORT (Case No. 11)

The patient is a twenty-one-year-old white female on whom a diagnosis of lymphoepithelioma of the nasopharynx, metastatic to cervical lymph nodes, was made by biopsy and microscopic study in November 1945. She was treated with roentgen therapy and radium needles with reduction of all masses. The last treatment was given in August 1946. There was no local recurrence of the tumor.

The patient remained asymptomatic until two months prior to admission in April 1947, when she developed high fever, weight loss, and anorexia. Examination revealed a pale, moderately emaciated, acutely ill patient; the temperature was 104°; the liver was palpable 8 cm. below the costal margin, firm, slightly tender and smooth. The spleen was not palpable. There was no enlargement of lymph nodes. The temperature rose daily to 104°-105°. Exhaustive studies for an infectious process were all negative. Biopsy of the liver revealed, on histopathological study, metastatic lymphoepithelioma to the liver. Hemogram showed 2,900,000 red blood cells; 31,350 white cells, 94.5 per cent neutrophils, monocytes 1 per cent, lymphocytes 4.5 per cent; 360,000 platelets. Serum proteins, icterus index, blood glucose and urea were within normal limits. Blood Kline and urinalysis were negative.

She was given 0.1 mg. of methyl-bis (B-chloroethylamine) HCl. per kg. of body weight for four consecutive days. A moderate degree of nausea and vomiting followed the first three doses. The temperature gradually returned to normal. The liver decreased in size and was palpable 5 or 6 cm. below the costal margin. She remained afebrile and developed a good appetite. A weight gain of 2 pounds occurred. She felt relatively well. Hemogram following treatment showed 3,500,000 red cells; 22,000 white cells, 85 per cent neutrophils, 15 per cent lymphocytes.

Twenty-six days after the first treatment a second course of nitrogen mustard was given, not because of recurrence of symptoms, but with the hope of giving her a longer remission.

Forty-three days after the initial treatment the liver was palpated 2 cm. below the costal margin. On August 1 the fever recurred and the liver was enlarged 5 cm. below the costal margin; it was very firm.

A third course of nitrogen mustard was given, approximately three months after the initial treatment. The liver became softer on palpation and the temperature approached normal. The white cell count was 8400 following treatment.

A fourth course of treatment was given in September, six weeks after the third course; at this time the liver had again become markedly enlarged. The fever was only of moderate degree, however. The hepatic size changed very slightly with this course of treatment. A leukopenia of 3000 was noted.

Because of the slight benefit derived from the

fourth treatment and because the patient's temperature remained at a relatively low level, no further treatment was given. She expired seven months after initial treatment.

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FATAL AND NEAR FATAL REACTIONS FOLLOWING INTRA- VENOUS MERCURIAL DIURETICS

Fatal and near-fatal reactions immediately following the intravenous injection of mercurial diuretics have been reported since 1931. Kaufman recently has collected 31 fatal cases and added one. Considering the wide use and value of these diuretics the matter is of much importance. The type of reaction under consideration is that which occurs during or within a few minutes of the injection. There are other reactions developing 6 to 12 hours after the injection which may be due to disturbance

of the electrolyte balance, to allergy or to the usual type of mercurial poisoning.

The cause of the immediate reactions is considered to be the toxic effect of the mercurial product in the heart muscle. The more severely damaged the heart muscle the more likely possibility there is of acute symptoms. Various investigators have found in animals electrocardiographic evidence of damage to the heart muscle. Other observers were able to get electrocardiographic tracings on two patients from the time they received the mercurial diuretic intravenously until they died shortly afterwards. Both showed the development of ventricular fibrillation. Another, Ben-Asher reported "An electrocardiogram taken during the reaction showed changes in the P wave, ST segment and the T wave, followed by ventricular premature systoles and paroxysmal ventricular tachycardia. The patient recovered and the electrocardiogram returned to normal sinus rhythm."

The reaction follows the use of different mercurial preparations: Mercupurin, Salyrgan, Neptal, Esidrone, Mersalyl. The diagnoses in the fatal cases were congestive heart failure 16, nephritis 7, nephrotic stage of nephritis 4, nephrosis 4, unknown 1. Six deaths occurred with the first injection and the others after a variable number up to the 200th. It is to be observed that the patients in this series were not necessarily moribund, as many were ambulatory. The interval between injections did not appear to be significant. However the speed with which the injection was given was thought to be important. The development of symptoms is sudden and within one to three minutes after completion of the injection. The patients gasps, cyanosis and pallor appear, there is substernal distress, dyspnea and irregular respiration, convulsions are reported. Recovery is apparently dependent upon the ability of the heart muscle to withstand the toxic effect and seems relatively uninfluenced by supportive measures.

In study of the published reports various recommendations are given to avoid so distressing an occurrence. No fatalities have

been reported following intramuscular injections so this may be used when effective. As small doses given frequently are more effective than larger ones at longer intervals 1 c. c. is advised as the intravenous dose. The diuresis following such doses is increased by the previous administration of ammonium chloride. The injection should be given slowly at the rate of 0.1 c. c. every 15 seconds. Small amounts of magnesium sulfate (0.5 c. c. of 20 per cent solution) have been advised as an addition to the intravenous mercurial to prevent ventricular fibrillation. Also 500 mg. ascorbic acid have been recommended for this purpose.

It would appear from these reports that caution is needed in the use of the mercurial diuretics and that the risk, small though it is, can be materially diminished by attention to proper details.

LEGISLATION AFFECTING PHYSICIANS

The Louisiana State Legislature has terminated its biannual session and many bills which concern the welfare of the physicians and the interest of the public in medical matters have been presented. Nowhere is it more conclusively shown than in certain proposed laws, that the public does not know its own interests. The dual role of the medical profession in treating disease and safeguarding the community health is clearly shown. The legislation committees of the Louisiana State Medical Society and the Orleans Parish Medical Society had a heavy responsibility here. In the last

session and for years past they are to be congratulated on their care and patience in presenting the viewpoint of organized medicine and in showing that over a period of years the interests of the profession and of the public are the same.

The "chiropractor bill" is presented to each session and each time our representatives have to appear and again plead that those who practice medicine should be properly trained. Presented to the last session were four bills concerned with the regulation of practical nurses. Three were not desirable. The one which was best adapted to the interest of the community as a whole was supported and it is hoped it will become a law.

Proposed laws that would affect physicians and hospitals adversely were the source of concern to our committees. One such bill would have removed from a hospital the right to control admissions of professional staff. Another would have made obligatory the acceptance of any hospitalization policy. The physicians' point of view was adequately explained in these matters.

The forward-thinking and altruistic citizens of the community look to us to direct and influence the trend of medicine in the community interest. It is to be hoped that the efforts of the Legislative Committees of the State and Orleans Parish Medical Societies will continue to be effective as in the past and that in related fields of endeavor where the profession and the public deliberate in the community interest our good offices are equally valuable.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

EXECUTIVE COMMITTEE MEETING

The first meeting of the Executive Committee, under the presidency of Dr. M. D. Hargrove, was held in New Orleans on May 15.

1948 MEETING

At this meeting Dr. John G. Snelling, Chairman of the Committee on Arrangements for the 1948 meeting held in Monroe, presented report of his committee. It was

stated that the amount of one dollar per capita appropriated for entertainment for the meeting and the special appropriation of \$1,000.00, approved by the Executive Committee, was not sufficient for handling of this meeting and the matter of finances for future meetings was discussed. It was decided that a special committee, from the Executive Committee, should be appointed to study this question.

1949 MEETING

The dates of May 5-7, 1949 have been approved for the next annual meeting to be held in New Orleans. Headquarters will be at the Roosevelt Hotel and arrangements are already underway in preparation for this the sixty-ninth meeting of the organization.

BLOOD BANK PROGRAM

The blood bank plan of the American Red Cross was discussed and the Executive Committee went on record as opposing this project as now planned and the national and state Red Cross headquarters and component societies of the State Society have been so informed.

VETERANS ADMINISTRATION CONTRACT

In view of existence of discrepancies and misunderstandings in connection with the contract between the State Society and the Veterans Administration for medical service to veterans, the Executive Committee was of the opinion that the contract should be discontinued. The Veterans Administration, United States senators and representatives from Louisiana and members of the State Society have therefore been informed that the contract is canceled effective June 30, 1948. As stated in the communication to members of the Society this decision was reached after serious consideration and was based on the fact that it is felt that the veteran has not been receiving the benefits of the home treatment plan as was anticipated by the terms of the contract and to continue such a contract would be unfair to the veteran. Members may, of course, continue to treat any present case until discharged but should discontinue taking new cases under the terms of the contract.

Termination of the contract between the State Society and the Veterans Administration should in no way prevent members from handling veteran cases on a personal arrangement.

LOUISIANA PHYSICIANS SERVICE

The Executive Committee was of the opinion that a meeting of the Liaison Committee of the Louisiana Physicians Service and the Executive Committee of the Hospital Service Association of New Orleans should be held as soon as possible and the Secretary was instructed to communicate with the Hospital Service Association to this effect.

LEGISLATIVE BILLS

The Committee on Public Policy and Legislation has been actively engaged in studying and opposing or sponsoring bills presented before the state legislature and a full report of this activity will be published for the benefit of members of the Society in a future issue of the Journal. This committee, of which Dr. Roy B. Harrison is chairman, has spent considerable time in Baton Rouge and it is through their effort and effort of other members who have assisted them, that undesirable legislation has been defeated and bills for constructive medical projects have been favorably acted upon. Our individual members should be cognizant and appreciative of this active, alert group of doctors who have done so much for organized medicine.

CONGRESSIONAL MATTERS

Action of the United States Senate in approving Senate Resolution 249, during the month of June, has put to rest for a while at least the Murray, Wagner, Dingell Bill and all bills proposing some form of federalization of medicine. Through appropriate committees the situation as to needs, financing and applicability for any improvement in medical care which this country might need, will be studied and report should be made in the Senate during the early part of 1949. Certainly political changes between now and then may influence the future course of this legislation. Action of the Senate in this regard was primarily due to three important factors:

(1) Breaking down of the selective service records of World War II, adversely to proponents of federalized medicine who leaned over backward on the implication that the great number of rejections was due to remedial causes. (2) The Brookings Report—a non-partisan report, prepared at the request of Senator Smith, on the needs of medical care, necessity for government supervision and future benefits, if any, to be derived if such a law is passed. This report was favorable to the cause of organized medicine and had a tremendous influence upon the Senate committee and the public. (3) Opposition of the medical profession.

We must not now, in the face of these achievements, become complacent or too jubilant about the future. It should be remembered that there is a national election and politics and individuals may have a tremendous bearing on the direction our government of the future will take. Be sure to keep vigilant.

MEDICAL CARE FOR VETERANS

Following is information contained in a

communication received from the Veterans Administration by the Secretary-Treasurer of the State Society:

"In the event that the renewal of the contract between the Louisiana State Medical Society and the Veterans Administration is not made by 1st of July, 1948, fees listed in VA Catalog No. 5 will be used, provided they do not exceed rates charged the general public for similar services."

It should be thoroughly understood that in view of the recent cancellation of the contract between the Veterans Administration and the Louisiana State Medical Society any acceptance of such a national fee schedule will be on a personal basis with the Veterans Administration as this is not in accord with the previous contract or intention of the Executive Committee of the State Society for the future. It is hoped that members of the Society will be guided accordingly and will be very alert in determining the nature of this agreement before participating in it.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

A meeting of the Sixth District Medical Society was held at Pallud's, Baton Rouge, on Tuesday, May 25.

The scientific program consisted of a lecture by Dr. Donovan C. Browne, of New Orleans, on results of proctoscopic examinations in a large series of cases. Dr. A. V. Friedrichs, of New Orleans, spoke on the work that the State Medical Society is doing to promote better public relations.

New officers elected were as follows:

President—Dr. H. Guy Riche, Sr., Baton Rouge.
Secretary—Dr. J. DeLoach Thames, Hammond.
Treasurer—Dr. Cecil Lorio, Baton Rouge.

Vice-Presidents: Ascension—Dr. D. C. Brumfield, Darrow; East Feliciana—Dr. E. M. Robards, Jackson; East Baton Rouge—Dr. Charles McVea, Baton Rouge; Iberville—Dr. Eugene Holloway, Plaquemine; Livingston—Dr. M. Williams, Denham Springs; Tangipahoa—Dr. M. B. Small, Kentwood; St. Helena—Dr. C. S. Toler, Clinton;

St. Tammany—Dr. Carl Young, Covington; Washington—Dr. Wm. S. Harrell, Bogalusa; West Baton Rouge—Dr. George Thomas, Port Allen; West Feliciana—Dr. C. J. Wise, Angola; Point Coupee—Dr. F. F. Rougon, New Roads.

The fall meeting of the Society will be held at Cave Tangi, Hammond, sometime in November.

L.S.U. MEDICAL ALUMNI ASSOCIATION

One hundred and thirty-five physicians attended the quarterly meeting of the New Orleans District of the L.S.U. Medical Alumni Association at Arnaud's Restaurant on June 10. Dr. Harold W. Stoke, President of Louisiana State University, spoke on "Progressive Medical Education". During his talk he stressed the need for the proposed \$2,000,000 eight-story addition to the present medical school building to provide additional classrooms, office space, a 500-seat auditorium, student laboratories, and research laboratories, which facilities would eventually allow the school to increase its enrollment by 20 per cent. Dr. Vernon Lippard, Dean of the Medical School, and Dr. Tom Richardson of Minden, Louisiana, President of the State Medical Alumni Association, also spoke. Dr. Jack R. Anderson, President of the New Orleans District, presided and announced that the Alumni Association would work for construction of a student dormitory and cafeteria. The next meeting of the L.S.U. Medical Alumni Association will be held in September.

NEWS ITEMS

Dr. Rudolph Matas has been awarded a life membership certificate in the Louisiana State Pharmaceutical Association. This was presented to him by Mr. William P. O'Brien, president of the association on May 5, 1948. It was given in recognition and appreciation of Dr. Matas' life-long friendship and assistance to the Louisiana State Pharmaceutical Association.

Eighty members of the graduating class of the School of Medicine, Louisiana State University, were awarded the M. D. degree at commencement exercises on May 29. The George S. Bel Memorial Award for outstanding scholarship was presented to Nicholas J. Olivier of New Orleans.

Dr. Charles M. Goss, professor of anatomy, School of Medicine, Louisiana State University, has been elected editor-in-chief of the Anatomical Record.

Dr. G. John Buddingh, formerly professor of bacteriology, Vanderbilt University School of Medicine, has been appointed professor of microbiology at the School of Medicine, Louisiana State University, effective July 1. Other recent appointments to the full-time faculty include Dr. Ruth A. Miller, formerly of Johns Hopkins School of Medicine, as assistant professor of anatomy; Dr. William Obrinsky of New York, instructor in pedi-

atrics; Dr. Thomas Hernandez of New Orleans, instructor in biochemistry; Dr. Irving M. Essrig of New Orleans, instructor in surgery; Dr. Jack C. Miller of New Orleans, instructor in obstetrics and gynecology.

Doctor Lucien A. LeDoux, President of the Southern Medical Association, attended a meeting of the Executive Council, which was held in Birmingham, Alabama on May 15. Among the many important matters discussed was one referring to the next convention meeting place and it was decided that the 1948 Meeting will be held in Miami, Florida the latter part of October. The exact dates and the convention headquarters hotel will be announced in the next issue of the Southern Medical Bulletin.

Dr. Julius Davenport, Jr., Southern Baptist Hospital, New Orleans, has been appointed official representative in Louisiana of the American Association of Blood Banks. Any questions relating to this Association should be referred to Dr. Davenport.

PROFESSIONAL OPPORTUNITY

A member of the State Society in Red River Parish is planning to retire shortly and would like to dispose of the facilities in connection with his medical practice. It is his preference that this be taken over by a young doctor since there is opportunity for a very active practice. There is available a two story fifteen bed brick hospital including complete operating room and instruments, delivery room, autoclave, x-ray, and diathermy. Adjacent to the hospital is a five room office building complete with laboratory and with a colored ward in the rear. For further information contact Dr. L. S. Huckabay, Coushatta, or the office of the Journal.

VETERANS ADMINISTRATION MEDICAL RECORDS

The Veterans Administration has in its custody the majority of syphilis records of those Army personnel who were treated for this disease while in active service, and in many instances can procure informative data from the syphilis records of other than Army personnel. It is thought that many physicians treating veterans for syphilis as private patients would find a resume of the syphilis record useful since the details of treatment, results of spinal fluid examinations, and blood serologies are incorporated in the records.

Resumes of these records are available to physicians who are treating such veterans provided authorization for the release of the data is given by the veteran. Requests for the resumes accompanied by an authorization for the release of the data, dated and signed by the veteran, should be addressed to the Dermatology and Syphilology Sec-

tion, Veterans Administration, Munitions Building, Washington 25, D. C. It is most important that the veteran's Service Serial Number and other identifying information, such as the date of enlistment, the date of discharge, rank, and organization be included.

Ordinarily, the resumes can be furnished in approximately two weeks from the date of the receipt of the request and signed authorization.

NAVY'S NEW MEDICAL TRAINING PROGRAM

The Surgeon General of the Navy has announced the expansion of the Bureau's professional training program for reserve and regular medical officers, which is similar to the recently expanded Army medical training program. The object is to permit more Navy doctors to meet the requirements for certification by the various American Specialty boards, and to encourage the young doctor to intern under the auspices of the Navy. The following are the important points in this program:

Graduates of Class A medical schools who have been accepted for internship by a hospital approved for such training by the Council on Medical Education and Hospitals of the A. M. A. may be commissioned as lieutenants (junior grade), MC, USNR, and permitted to continue their intern training. They will receive all the pay and allowance of the rank while so serving. After completing their internships, the medical officers must remain on active duty for a period of one year. If they meet the professional, physical and moral requirements, they will be given every encouragement to transfer to the regular Navy.

Interns who have completed the one year of obligated service, and who have transferred to the regular Navy, may be considered for residency training on a competitive basis with other officer personnel of the regular Medical Corps.

Resident physicians now in civilian hospitals, or those accepted for approved residency training, are eligible for commissions in the regular Navy. Those so commissioned will be assigned to duty, with full pay and allowances, in the hospital in which they are already a resident, or to which they have been accepted for residency training. Every attempt will be made to permit residents holding commissions in the regular Navy to complete their training in event of an emergency.

The obligated service following graduate medical training (courses, fellowships and residencies) in Naval hospitals is one year for each year of training received.

Information concerning any part of the program may be obtained by writing to the Chief of the Bureau of Medicine and Surgery, Navy Department, Washington 25, D. C.

AMERICAN ACADEMY OF GENERAL PRACTICE

Dr. J. P. Sanders, of Shreveport, was recently elected Vice-President of the American Academy of General Practitioners at a meeting held in Chicago.

WOMAN'S AUXILIARY PRESIDENT'S GREETING

As president of the Woman's Auxiliary to the Louisiana State Medical Society I wish to extend greetings and best wishes to all members of the Auxiliary and to my prospective members.

It is a great honor to be chosen president of this organization for which I am deeply grateful and humble. I have endeavored to acquaint myself with the mechanism which activates this Auxiliary. There is still much to be learned and can only be learned by actually doing the things expected of a person assuming this office.

The Auxiliary has had a phenomenal growth under the capable direction of the splendid group of presidents who preceded me. With the cooperation of the entire Auxiliary the new president may hope in a small way to emulate the example of the distinguished past presidents.

The Auxiliary members seem happy about our new publication. We owe a debt of gratitude to the Council on Medical Service and Public Relations of the Louisiana State Medical Society for naming, publishing and mailing our little magazine which was born during the recent state convention held in Monroe. Like all newborns its future is not clearly foreseen but we want it to be a mouthpiece of information and help in the work of the Auxiliary. You can help feed the new baby with ideas, plans and suggestions. In the first issue we hope to have information which will reach you in time for year-book making and planning of general work.

Any worthwhile enterprise must grow and expand its services to its members and to the public at large in order to be alive and alert. This shall be the aim of my term of office.

We invite your help, your ideas and your criticism. We will make every effort to make the best possible use of them.

MRS. O. B. OWENS,
State President

BOOK REVIEWS

Scientists Starred, 1903-43 in "American Men of Science": by Stephen Sargent Visser, Baltimore, John Hopkins Press, 1947. Pp. 556. Price \$4.50.

The late J. McKeen Cattell created the directory *American Men of Science*. In the seven editions since 1906, an asterisk has been placed before the

names of 2,607 scientists. These were chosen by leading research scientists on the basis of their knowledge of the individuals and their scientific attainment.

Dr. Visser has made a detailed study of these starred scientists as to their preliminary, collegiate and doctoral training, place of birth, geographic distribution, background, developmental and other influences. If utility is to be a criterion by which to measure Dr. Visser's work, the result will be disappointing. Many of these scientists were highly trained while others attended institutions not well known and some have had relatively little basic training but "Scientists Starred" is exceedingly interesting and represents a truly great piece of research study even though it resulted in no formula for the mixing of certain ingredients which would ultimately produce great or distinguished scientists.

The author himself concludes that "Large classes and student body are unfavorable to the production of future scientists" and that science students must have intimate contact with stimulating teachers.

H. W. KOSTMAYER, M. D.

Physiology of Man in the Desert, by E. F. Adolph and associates. New York, Interscience Publishers, 1947. Pp. 357. Price, \$6.50.

This book presents data collected by a number of observers. The results are well illustrated by numerous charts throughout the book. The methods of investigation were the best available under the circumstances, but numerous problems are left unanswered. It is difficult to obtain an adequate series of controls under the conditions of the experiments.

The greater part of the book deals with water balance and protection from heat. The endurance of man under varying amounts of water deprivation is presented. Methods of protection against the extreme physiologic demands of a hot and dry environment are adequately discussed and illustrated.

More attention might have been given to electrolyte balance. The role of the kidney in maintaining isotonicity, particularly of sodium, seems neglected.

The text could well be condensed by eliminating repetition in the chapters written by the various contributors.

This book presents important data on the normal physiologic reaction of man to life in the desert and is a valuable contribution to the literature on this subject.

THORPE RAY, M. D.

Clinical Toxicology, by Clinton H. Thienes and Thomas J. Haley. Second Edition. Publisher:

Lea and Febiger, Philadelphia, 1948. Pp. 373. Price \$4.75.

In preparing a textbook on toxicology authors are undoubtedly confronted with the difficulty of dealing adequately with an almost endless list of drugs and chemicals which are potential poisons. This is especially true if the field of organic industrial poisons is included. A work, encyclopedic in nature may be attempted or as an alternative a shorter book probably more suitable for the student or practicing physician may be written by judicious selection of substances for consideration and by avoiding where possible discussion of controversial mechanisms of action and methods of treatment. The present authors have followed the latter course. As stated in the preface the poisons described are those most frequently encountered or those which serve to typify a certain group of poisons. The classification of contents is according to major toxic action rather than by chemical structure. This is indicated by such chapter headings as cerebral convulsants, cord convulsants, toxicology of general anesthetics, muscle poisons, cardiac poisons, local irritants and corrosives, kidney poisons, poisons of mineral origin, bone marrow poisoning, etc. Each poison is discussed where applicable under such headings as toxic dose, etiology, absorption, symptoms and action, duration, fate and excretion, pathology, diagnosis and treatment. A useful section of the book concerns general principles of treatment. This is followed by an outline of symptom diagnosis in which the various drugs are listed which may cause such effects as circulatory collapse, hemorrhage, convulsions, constipation, etc. A section on chemical diagnosis of poisoning is of more interest to the toxicologist than to the general practitioner. It describes some of the more specific chemical tests and a few biological tests. Most of these are qualitative in nature but quantitative procedures for arsenic, bismuth, lead and mercury are included. The value of a synoptic work of this nature in which numerous statements are at least questionable would be increased by a bibliography.

RALPH G. SMITH, M. D.

Private Enterprise or Government in Medicine, by Louis H. Bauer, M. D. Charles C. Thomas, Springfield, 1948. Pp. 201. Price \$5.00.

This small volume describes the growth of government in medicine, the development of compulsory sickness insurance, both in this country and abroad, and draws several conclusions regarding health conditions in the United States. It also outlines the program of the American Medical Association, and recently proposed federal health legislation. The theme of the book is that compulsory insurance is un-American and that it encroaches on the freedom of the individual until he has nothing left. The conclusion presented is that group hospitalization and voluntary medical care

insurance of various types will eventually meet the needs of this country and make any compulsory plans unnecessary.

CLAUDIA PYE.

Psychopathology and Education of the Brain-Injured Child, by Alfred A. Strauss and Laura E. Lehtinen. New York, Grune & Stratton, 1947. Pp. 206. Price \$5.00.

This scholarly presentation of the brain injured child from a combined neurological, psychological and educational point of view should be of interest to both psychiatrists and pediatricians. It is recommended as required reading for medical students in pediatrics, teachers of special classes, nurses specializing in pediatrics, and graduate students in psychology. The book is a culmination of many previous studies by Dr. Strauss concerning the mental organization of the child with brain injury, his disturbances in perception and thinking, and his deviations in behavior. The contributions of Gestalt psychology to the understanding of such children's difficulties are explained; and the approach to the problem with studies by Goldstein of brain-injured adults is illustrated. Recent clinical-psychologic studies are cited.

Detailed case histories, drawings and diagrams of the brain, and illustrations of tests used make the book both easily read and interesting. Many psychologists have been seeking for tests best suited to children with organic brain damage, and this book is the answer to their quest. References and bibliography are thorough.

The section on education should be recommended

particularly to superintendents of schools and directors of special education.

The book fills a real need, is sound in its psychologic approach, and contributes helpful material on a subject concerning which all too little is known by those dealing with brain injured children.

MARION FONT.

PUBLICATIONS RECEIVED

Blakiston Company, Philadelphia: *Practical Bacteriology, Hematology, and Parasitology* (10th edition), by E. R. Stitt, M. D., Ph. M., Sc. D., LL. D., Paul W. Clough, M. D., and Sara E. Branham, M. D., Ph. D., Sc. D.

Doubleday & Company, Inc., New York: *Successful Marriage*, edited by Morris Fishbein, M. D. and Ernest W. Burgess, Ph. D.

Froben Press, Inc., New York: *Essays on Historical Medicine*, by Bernard J. Ficarra, A. B., Sc. B., M. D.

Rodale Press, Emmaus, Pennsylvania: *The Healthy Hunzas*, by J. I. Rodale.

W. B. Saunders, Philadelphia: *A History of the Heart and the Circulation*, by Frederick A. Willius, M. D., M. S. in Med. and Thomas J. Dry, M. A., M. D., Ch. B., M. S. in Med.; *Modern Clinical Psychiatry* (3rd edition), by Arthur P. Noyes, M. D., *Treatment of Heart Disease*, by William A. Brams, M. S., M. D., Ph. D.

Charles C. Thomas, Springfield, Illinois: *Hemostatic Agents*, by Walter H. Seegers, M. S., Ph. D. and Elwood A. Sharp, M. D., Sc. D.

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POSTRABIES VACCINE PARALYSIS*

SHEA HALLE, M. D.†

NEW ORLEANS

In 1885 Galatier and Pasteur demonstrated the infectious origin of rabies. Pasteur shortly thereafter developed a prophylactic treatment against the disease. Since then this preventive has been employed almost universally, but with its introduction has come a complication—the possibility of postrabies vaccine paralysis. Recently the seriousness of these complications was forcibly presented to us when two patients were admitted to the Veterans Administration hospital with encephalomyelitic lesions following vaccine treatment. In each instance the indication for the Pasteur treatment was questionable. The history relating to both of these patients reveals the presence of large numbers of rabid animals in the vicinity, and the promiscuous use of the vaccine for other individuals in the community. Because of these circumstances, the following two cases are being reported, and it is our belief that a discussion of the types, incidence, etiology and therapy of postvaccinal reactions, and indications for application of the Pasteur treatment, is invited.

CASE REPORT

Case No. 1.

A twenty-four year old white male was admitted

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to the hospital complaining of weakness of all extremities, and inability to void.

Fifteen days prior to admission the patient was bitten by his dog. Within twenty-four hours the dog died and the patient was started on antirabic vaccine. Study of the dog's brain was not carried out. A local physician used a reputable Semple-type vaccine for immunization. A detailed review of the injections received reveals: First day: Immediate reaction, around the site of injection in the abdominal wall, consisted of a red tender "lump" in skin. This subsided in a few hours. Second day: Same. Third day: After this injection the patient developed chills, fever and headache; these subsided overnight, and the injections were continued. Fourth to tenth days: During this week the patient had severe malaise, headache and drowsiness, with an exacerbation following each injection. After the tenth injection the headache became severe; the neck was painful especially on movement. Backache increased in intensity, and chills and fever occurred several times. The eleventh injection was given in bed because the patient was unable to get up. Shortly thereafter he could not move his limbs, was unable to void or defecate voluntarily, and became very drowsy. He was catheterized following the eleventh injection. On succeeding days two more injections were given, but the patient has no recollection of these, or other incidents following the tenth injection. A total of thirteen injections was administered.

Two days after completion of the series, the patient was brought to this hospital for treatment.

Physical Examination: The patient was a semistuporous white male, well developed and well nourished, apparently seriously ill, and poorly responsive to questioning. Blood pressure 130/80. Pulse 95. Temperature 100.0° F. Respiration 25. There was marked herpes labialis, and the abdomen was diffusely tender to deep palpation. Other positive physical findings were neurological. Cranial nerve functions were intact except for transient diplopia and slurring of speech. The motor system revealed generalized weakness of all extremities, with moderate flaccidity. Some

function remained in thighs and toes (slightly more in upper extremities), but there was marked loss of ability to coordinate motions of the hands and upper extremities. Deep reflexes originally were diminished in left upper extremity, both ankles, and left knee. Abdominal reflexes were bilaterally absent. There was suggestive Babinski bilaterally. Tests of sensory perception revealed spotty areas of hypesthesia above T10, and spotty areas of hyperesthesia below this level. Also observed were inability to void or defecate. The anal sphincter was relaxed.

Laboratory Examinations upon admission: Blood: WBC 6400/cu. mm.; RBC 4,250,000/cu. mm. Differential: Neutrophils 77%; Lymphocytes 21%; Monocytes 1%; Eosinophils 1%.

Urine: Albumin, heavy trace. Sediment, 20 RBC's per hpf.

Lumbar puncture: Normal dynamics, clear fluid. Initial pressure 180 mm. water. Cells, 40-30 Lymphocytes, 10 Neutrophils. Total proteins, 35 mgs.%. Chlorides 742 mgs.%. Sugar 80 mgs.%. Colloidal Gold 0000000000. Wassermann negative. Cultures negative.

Seven days later—Lumbar puncture: Colloidal Gold 2222332200. Cells 55 Lymphocytes/cu. mm. Total proteins 190 mgs.%.

Course in Hospital: The neurologic status changed constantly, with paresis becoming more severe, until all muscle function in the lower extremities was lost. Some function remained in the neck muscles, and in the biceps and deltoids, but little in the forearm or hand. Occasionally, speech became indistinct. Intercostal muscles were undisturbed. Reflexes changed daily, and a hyperactive left knee jerk appeared for one day. Sensation also changed daily, with the hyperesthesia in lower extremities becoming more marked. A retention catheter was placed in the bladder. Fluids were supplemented by parenteral administration. Patient took some nourishment by mouth, despite frequent nausea and vomiting. The acute process gradually subsided over two to three weeks, with the patient becoming more responsive. Diplopia disappeared after two weeks with no further speech changes being noted. Three weeks after admission, patient began to have some return of function in the upper extremities. Physical therapy was then started. A return in the psoas and quadriceps muscle function followed, but legs and feet were totally paralyzed. Fecal impaction threatened on several occasions, and repeated enemas were essential for its avoidance.

There was no indication of returning bladder function, and a severe infection of the lower genito-urinary tract developed because of a retention catheter. Suprapubic cystotomy, therefore, was resorted to about five weeks after admission. Cystograms at this time revealed no marked change in bladder size or shape. The bladder held

more than 30 ounces of fluid on several occasions without overflowing. This caused mild discomfort, suggesting hypotonicity of the bladder wall. A month after admission the patient had his first voluntary bowel movement. During the following two months there was gradual return of function and the patient was able to sit up. At the beginning of the month he began to move his toes, and several weeks later motion returned to his ankles and legs. After fourteen weeks he began to void voluntarily, and the suprapubic catheterization was terminated. Urine then revealed gross pus and blood with 2 to 3 plus albumin and a few casts from time to time; cultures revealed urea-splitting organisms. However, once voiding became voluntary, therapy with sulfonamides and streptomycin cleared the genito-urinary infection.

Eight months have passed since this illness. The patient has regained full use of the upper extremities and the left lower extremity. However, the left quadriceps function is very weak and physical therapy is still being administered. Objectively, it appears that the patient will regain almost completely previous muscular power.

Case No. 2.

A twenty year old white male was admitted to this hospital complaining of headache, and inability to walk and void. About two months prior to this admission the patient's schoolmate was bitten by a dog, and one month later became acutely ill and died within three days. It was believed that he died of rabies. The patient, and many of his neighbors (variously estimated as 20 to 60 people), requested the Pasteur treatment from their local physician despite the fact that they had had no contact with the rabid dog, and only casual contact with the schoolmate. Antirabic injections were begun on the 21st of August and continued with daily injections until the 31st of August. After the seventh day, he complained of malaise, headache, and slight fever, as well as edema, induration and soreness at the site of injection. Injections were, nevertheless, continued until the time the patient was unable to walk; he then decided to enter a hospital for treatment.

Physical Examination: Pulse 88. Temperature 102.0° F. Patient was emaciated, obviously ill and apathetic. He responded slowly to questioning. There was transient diplopia, nystagmus in all directions, moderate photophobia, and mild stiffness of the neck. All reflexes were bilaterally equal, and there was no disturbance of sensation; however, the bladder was easily palpable at the umbilicus. There was generalized weakness.

Laboratory Examinations: Spinal tap: Clear fluid. Pressure 230 mm. of water. Normal dynamics. Cell count 27/cu. mm. Lymphocytes 97% Protein 56 mgm.%. Complement fixation and gold curve—Negative.

Hemogram revealed 10,250 WBC's and 4.1 million

RBC's/cu. mm. Differential; Neutrophils 87%.
 Urine: Positive for acetone.
 Sedimentation rate: 24.

Course in Hospital: A few days following admission the tendon reflexes on the left diminished, diminution being most marked in the left lower extremity. Pain and touch sensations were normal. Later this was followed by diminution of reflexes of the right lower extremity, these finally disappearing completely. The cremasteric reflexes disappeared as did the abdominals. There were very slight muscle residuals left in the upper extremities. The lower extremities were completely paralyzed, with all reflexes being absent. A suprapubic cystostomy was done because of inability to void.

Within two weeks after admission the patient began to show improvement. The nystagmus and diplopia disappeared. At that time there was only slight residual movement left in upper extremities. At the present time, which is six weeks after admission the patient has continued to progress, slowly but favorably. Some function has returned to the left upper extremity. It is too early to predict the degree of muscle function that may be expected.

TYPES OF REACTION

There are two general types of reactions to the Pasteur treatment: The first includes skin reactions, localized or generalized. These are common, have no associated mortality, and are no contraindication to further therapy. The second type of reaction is the neurologic, and this group is more serious. Horack⁴ has divided the two types into six groups:

Group 1. The prompt development of a generalized urticarial rash which responds to the use of adrenalin, and which usually develops in those who have been sensitized by previous injection of nerve tissue. These cases are relatively infrequent and are without mortality.

Group 2. Delayed reactions of the tuberculin type occurring at the site of injection and characterized by local redness, induration, tenderness, and itching. These are the most common type of local reaction encountered. They occur early during the treatment, but are not of serious import.

Group 3. Reaction of the type described as Group 2, but more severe, and frequently associated with constitutional reactions consisting of headache, low-grade fever, lymph-node enlargement, nausea, and general feeling of malaise. Subsequent injections

are apt to cause a flare-up at the previous injection sites. It is these patients that one should observe closely for signs of the development of paralysis, and judge their treatment accordingly. These cases are less common than those described in Group 2.

Group 4. The simple peripheral neuritic form, following a short febrile attack and commonly involving the facial nerve.

Group 5. A dorsolumbar myelitis, usually occurring during the second or third week of treatment, and characterized by the gradual onset of fever, weakness, numbness, tingling of the lower extremities, sphincter disturbances, and terminating in paralysis of the extremities. The local reactions are of the more severe type described under Group 3. The mortality rate is low.

Group 6. Paralysis of the Landry type, which is sudden in onset and is associated with high fever, nausea, insomnia, vomiting, headache, girdle pains, retention of urine, and an ascending paralysis. About one-third of these patients die of bulbar paralysis. Local reactions are those of Group 3.

INCIDENCE

The incidence of paralytic reactions varies markedly from place to place, even when similarly prepared vaccine is used. Large series, such as that compiled by McKendrick⁶ (League of Nations Rabies Conference) show an incidence of from 1 in 3398 ("live" vaccine) to 1 in 8887 ("killed" vaccine), with almost two million patients treated. Smaller American series show a ratio of 1 in 450 (Hygienic Clinic of Public Health),⁵ 1 in 5000 (Georgia),¹¹ and 1 in 1200 (North Carolina).⁴ American groups generally use "killed" vaccine, ordinarily prepared by a modification of the Semple technic. Differences in preparations used are believed unimportant so far as results are concerned. However, they do affect the number of reactions. The great discrepancy in the number of reactions reported above from various treatment centers may be the result of poor reporting of complications in the larger series. However, Charity Hospital of Louisiana in New Or-

leans has treated 7,000 patients with rabies vaccine, with no known paralytic complication. Charity Hospital vaccine is prepared by a modification of the Semple technic.^{7, 8}

If one compares the incidence of post-rabies vaccine paralysis cited above with the incidence of rabies following treatment, one finds in McKendrick's large series the statistics as enumerated in Table 1.

TABLE 1

MORTALITY FROM RABIES FOLLOWING ANTIRABIES TREATMENT OF MAN				
No.	(McKendrick, 1940) Exposure		Per cent mortality	Proportion : 1 in
34,465	Contact; no bite	<div style="display: inline-block; vertical-align: middle; font-size: 3em; line-height: 1;">}</div> <div style="display: inline-block; vertical-align: middle; margin-left: 0.5em;">Animal proved or suspected rabid</div>	0.0005	17,235
26,766	Head bite		1.29	77.5
228,370	Arm bite		0.15	676
18,003	Trunk bite		0.02	4,500
167,400	Leg bite		0.05	2,100

These statistics reveal the grave significance of head bites and arm bites, and the lesser significance of contact with no bite, and leg and trunk bites. Charity Hospital has had eight deaths from rabies in 7,000 cases, an incidence of slightly more than 1 in 1000.⁷

ETIOLOGY

There has been little agreement as to the cause of the reactions described. At first, it was suspected that they were due to an atypical or modified type of paralytic rabies; then a case was found in which paralysis followed treatment although the dog involved was not rabid. In later years, other possible causes implicating the vaccine have been entertained. The street virus used in preparing the vaccine was one of these; another was that toxic material from the rabbit cord, or a neurotropic substance in the rabbit cord was at fault. Bassoe and Grinker^{1, 3} presented the possibility of an unknown virus latent in the patient's central nervous system, aggravated by the vaccine. This, they feel, would explain the entire group of postvaccinal and nonvaccinal disseminated encephalomyelitic reactions which pathologically are alike. Smallpox vaccination and the exanthematous diseases such as measles, chickenpox, mumps, smallpox have all been associated with encephalomyelitic syndromes similar to those discussed in this paper.³

An impressive possibility at this time is an allergic basis for the reaction. Horack⁴ has reviewed this possibility and in a special study found marked allergic histories in patients who had shown reactions. In most patients the disease started during the second or third week of treatment and was preceded by varying grades of local reaction, or general reaction similar to those in patients showing sensitivity to foreign protein injection. Under such circumstances edema, erythema, induration, and pain are often found at the local site of injection. Also there may be urticaria and other constitutional symptoms of general body reaction. Support of this contention is brought out in Seller's series, in which it was shown that five of the seven paralytic reactions occurred in patients who had taken a previous course of the Pasteur treatment.¹² In addition, Schwentker and Rivers¹⁰ found experimentally that brain tissue can act as an antigen and produce organ specific antibodies—at least in rabbits. They conclude that paralytic reaction following antirabies vaccination probably is associated with the development of specific antibodies for brain.

INDICATIONS FOR THE PASTEUR TREATMENT

Although many capable observers question the value of the Pasteur treatment,¹⁴ there are few who oppose its use, at this time, in any patient exposed to rabies, a disease which has been shown to be a uniformly fatal one. However, those with most experience in such therapy are conservative in prescribing specific treatment. Sellers, after long, close observation, believes that the Pasteur treatment should be used only "for persons known or suspected to have been bitten by rabid or suspicious animals."¹² No cases of rabies developed in his series in persons known not to have been bitten. This is true also of large Alabama² and Louisiana⁸ series in which injury by the teeth of rabid animals accounted for all the deaths. In Table 1 among those with history of exposure other than bite, only one person in 7235 developed rabies. Therefore "exposure" by getting saliva on the bare skin or even in contact

with pre-existent abrasions or by handling the animal^{11, 12} is not an indication for treatment. The risk of serious treatment reaction is greater in non-bite cases than the risk of developing rabies. Children, however, are usually treated for contact because of the poor history obtainable, and also because of the lesser danger of reaction from the vaccine. Few postvaccinal paralytic reactions have been reported in children under 15 years.⁸

A major problem involves the bite by a stray dog which cannot be found. Here treatment usually should be given, especially in areas where there is a large reservoir of rabies in the dog population. The public must be taught to catch dogs that have bitten, and never to kill such dogs until a two weeks' observation period is over. In one of our cases the dog died soon after biting the patient. No attempt was made to examine the brain for rabies. It is possible that the dog died from some other cause.

In persons bitten by a dog that can be observed, there is no danger in waiting up to two weeks before giving the vaccine therapy for all bites except those involving the head and upper arm. Because of the high incidence of rabies following bites on the head and upper arm, it is generally accepted to start treatment immediately. The treatment can be interrupted if observation finds the dog involved to be free of rabies.

Most trouble comes from the great fear of rabies in the community. A panicky community in Louisiana recently demanded the Pasteur treatment for many of its citizens after a young man had died of rabies there. Our case, listed second in the foregoing, is the result of this mass demand for treatment. The demand was made despite the fact that nobody had been bitten by the dog except the one who had died of rabies. The public should be warned that the Pasteur treatment is not without danger; that the physician must make the decision as to its use.

DESENSITIZATION

Once treatment has been decided upon, the question of desensitization technic to

avoid reaction arises. Horack⁴ urges a complete allergic history and the testing with a small dose of diluted vaccine before starting treatment; then, if the patient is sensitive he urges desensitization by the use of graduated doses until the full dose can be given. If a reaction occurs during the course of treatment he again resorts to desensitization before going on. Further details are available in his article.⁴ However, most treatment centers, like Charity Hospital, have not resorted to desensitization technics. Pizzolato,⁹ working at the Charity Hospital Pasteur Clinic for three years, skin-tested all patients with a history of either *allergy* or a *previous course of treatment*. He found no evidence of a positive skin reaction to the vaccine in either group. This suggests that skin-testing is not helpful. However, skin-testing should be done before giving repeated courses of antirabies treatment. Up to the present time there have been no paralytic reactions in Charity Hospital's Pasteur Clinic.⁷

There are two situations in which desensitization is probably worthwhile. One is the case of a dog bite by a rabid animal, especially on the face or hands, with the development of a paralytic reaction during therapy. In these cases great danger of rabies is still present; if treatment is to continue it is probably wise to desensitize first. The other situation involves the patient who has had the Pasteur treatment previously. The Georgia series¹² warns of the grave dangers of reactions in these cases. As already mentioned five of seven paralytic reactions occurred in patients receiving their second course of treatment. Sellers used a five-to-six day treatment course given very cautiously in these repeaters. He considers this a booster to immunity mechanisms produced by a previous course of treatment. He also recommends stopping this booster course at the slightest hint of trouble—even marked *local* reaction.

Every patient applying for antirabic vaccine therapy must be individualized. The physician, not the patient, must decide if the therapy is needed since the patient

cannot appreciate the danger associated with the treatment.

TREATMENT OF REACTION

Little can be added to the known treatment of these encephalomyelitic complications. Profiting from experience in our first case, a suprapubic cystotomy was done early in the second case. This procedure should probably be used if paralysis of bladder and muscles suggests long delay in return of function.

Both of our cases were started on antihistaminic drugs fairly early, but no significant results were obtained. A nourishing diet, parenteral fluids, vitamins, physical therapy and general supportive care were given; fecal impactions were avoided only by vigilant care.

DISCUSSION

Although in this paper we have concerned ourselves primarily with paralytic reactions to the Pasteur treatment, the real problem is the eradication of rabies. This can only be accomplished by an active campaign against reservoirs, chiefly dogs and cats, in the community. By *destroying strays* and muzzling or restraining pets, this menace can be controlled. Other possible measures are immunization of dogs against rabies, and strict dog-quarantine laws. Especially is this important now in view of the rising incidence in the past few years of rabies in animal brains examined at various centers in Louisiana.^{7, 8}

For the present though, when giving the Pasteur treatment, the indication should be considered carefully. The patient should be individualized. If patients continue to insist on treatment, it may be wise to restrict the use of the vaccine to local public health or hospital centers. Among the advantages would be more accurate reporting of treatment results, failures, and reactions. Also, the number of exposures other than real bites that are treated would be decreased.

Finally, the use of desensitization technic should be considered in the presence of marked allergic history for severe reaction from injections. The grave danger from more than one course of treatment should be kept in mind.

SUMMARY

1. Two case histories of encephalomyelitic reactions following the Pasteur treatment are presented.

2. The etiology and incidence of these reactions are reviewed.

3. Indications for the use of the Pasteur treatment are considered.

4. Desensitization technics and the treatment for paralytic reactions are mentioned.

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THE NECESSARY PERSONAL ORAL HYGIENE FOR PREVENTION OF CARIES AND PERIODONTOCLASIA*†

CHARLES C. BASS, M. D.

NEW ORLEANS

Almost all loss of teeth results from either caries or periodontoclasia. These two diseases can be prevented by the necessary personal oral hygiene. They cannot be

*Studies promoted by facilities to which the author has had access at the School of Medicine, Tulane University of Louisiana, and by aid for equipment and supplies provided by the University.

†The substance of this paper was presented before a special meeting of the New Orleans Dental Association March 11, 1948.

prevented in any other way now known. The purpose of this paper is to present the oral hygiene procedure every person must follow in order to entirely prevent these diseases and their consequences, and in order to maintain the state of oral cleanliness most people would like to maintain. The personal oral hygiene procedure here presented as essential has evolved from practical application of already well known fundamental information and more recent additional pertinent information that has been published or is in process of publication.¹⁻⁴ By intensive microscopic study of extracted teeth, employing technical procedures^{1, 2, 5} not usually employed for this purpose, it has been possible to secure more accurate information regarding the conditions at the locations and in the environment where caries and periodontoclasia begin.

To prevent the occurrence and progress of the lesions of these diseases their early stage must be prevented. The oral hygiene necessary to prevent these diseases, therefore, must effectively meet and counteract the etiological conditions at the locations where the lesions originate.

WHERE CARIES BEGINS

Enamel caries begins principally at or about occlusal pits and fissures and at or about the contact area between teeth. The earliest lesion consists of a "white spot" of "chalky," partially decalcified enamel. If the conditions are prolonged the lesion extends in area and depth and finally this fragile, partially decalcified enamel breaks down producing a cavity—the advanced stage of caries. The cavity, if large enough, usually can be diagnosed by the dentist but most of the earlier stage lesions cannot be recognized, except upon extracted teeth.

Some idea of the frequency and extent of these early stage lesions can be gained by very simple procedure, even without any microscopic laboratory equipment or experience. All that is necessary is to place extracted teeth (preferably from persons under 20 years of age) in 10 per cent hydrochloric acid (water 85, formalin 5, HCl 10) for one minute, then wash and brush with

an ordinary toothbrush to remove the loosened cuticle, bacterial film and debris. Any "white spot," early stage caries lesions present can be seen satisfactorily (Figure 1) with the unaided eye. They contrast



Fig. 1. Tooth from which the cuticle and bacterial film were removed by application of acid and then brushing. Note area of "white spot" (1) chalky enamel (early stage caries) contrasts with normal enamel. Cemento enamel junction (2). Small cavity (3).

well with the more transparent normal enamel. The contrast is even sharper after the specimen has been allowed to dry. Under magnification, the lesions may be observed and studied better. Ordinary hand lenses are quite helpful. The dissecting microscope is still more helpful in studying such preparations.

It will be observed that some of these partially decalcified areas have more or less brown stain. In most instances these are old lesions which have been inactive for some time, due to changes in the environ-

mental conditions which formerly initiated the lesion and promoted activity. A good example is proximal lesions on a tooth where the contacting tooth was lost some time previously. Such inactive lesions are more often found on teeth from people past 25 years of age.

Sometimes a small broken down area (cavity) may be observed in a larger area of partially decalcified enamel which still holds its form. It will be observed that most small to medium size cavities have more or less unbroken chalky enamel about them. (Figures 2, 3).

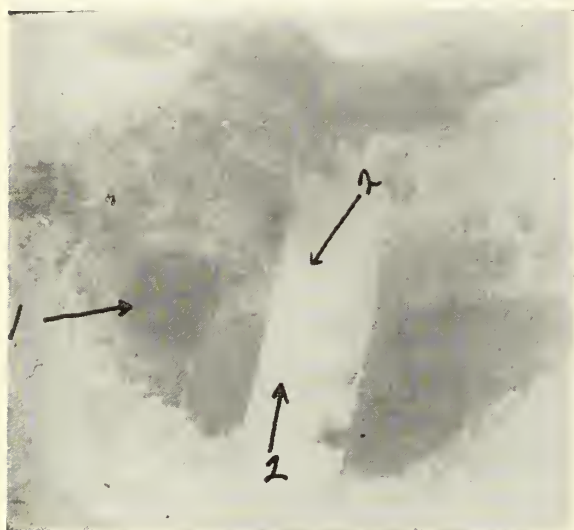


Fig. 2 Area on proximal of molar with cavity (1) and chalky enamel (2). Two parallel cuts were made through the cuticle to include the edge of the chalky enamel. Specimen in acid 1 minute, rinsed and then stained with crystal violet. Strip of loose cuticle removed, exposing some of "white spot" area. Clear strip from which cuticle was removed contrasts well with stained cuticle and bacterial film still in place on either side.

No cavity ever forms except as a result of breaking down of this earlier stage decalcified enamel. The early stage, partial decalcification, therefore always precedes cavity formation. Prevention of cavity formation and its consequences can be accomplished only by recognition of the etiological conditions at the location where the earlier partial decalcification occurs and by application there of effective measures for preventing or minimizing those conditions.

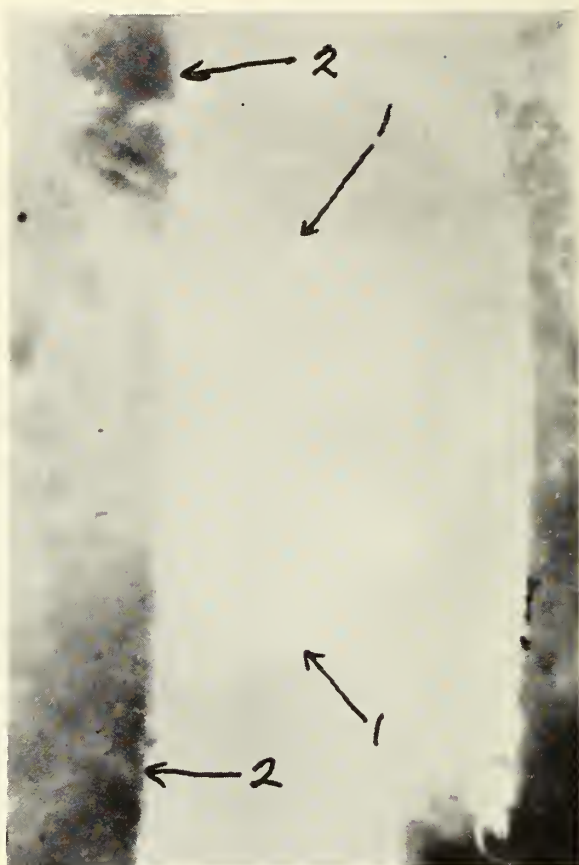


Fig. 3. Higher magnification of area on Fig. 10, showing chalky enamel extending outward from beneath cuticle on left side which was retained in place.

THE ENAMEL CUTICLE IN RELATION TO THE EARLY STAGE OF CARIES

It has been shown² that the enamel cuticle bears an important relationship to the early stage of caries. The enamel cuticle is an extremely thin keratin-like, transparent membrane covering the entire enamel surface at all times. It is thinner over areas where it is repeatedly worn by functional or other friction than in other areas where it is not exposed to such friction. However it is extremely thin in such areas also. In view of some confusion and conflicting opinion as to the continued presence throughout life of an enamel cuticle, it may be worthwhile to give here a simple procedure whereby anyone who is interested can clarify the matter for himself. Again this can be done without the aid of microscopic laboratory equipment or experience.

Place a tooth specimen in the 10 per cent

HCl for one minute; remove gently and dip in water for a moment to reduce the acid; place in 0.5 per cent crystal violet solution (crystal violet 0.5 gm in water 100 cc) for one minute or less; again dip in water to remove excess of stain. Now observe the loosened cuticle with the tooth immersed in a shallow dish of water in which the membrane may be teased off with some suitable delicate instrument (No. 2 or No. 7 Cleveland or S. S. White Explorer) and manipulated in the water. The cuticle itself is slightly stained and the bacterial film upon it is heavily stained. When floating in the water the membranous nature of this material from the surface of the enamel is readily recognized. One who examines a few specimens in this simple way knows, of his own knowledge, that an enamel cuticle is continuously present on teeth. This enamel cuticle is of interest in relation to caries because the bacterial film over the early stage lesion is firmly attached to the cuticle (Figure 4) and because the acid or

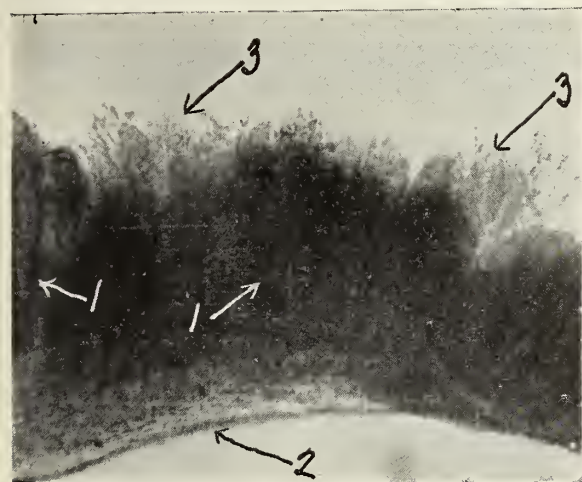


Fig. 4. Section through cuticle and attached bacterial film removed from over early stage caries. Note parallel arrangement of organisms (1) extending from cuticle (2) outward toward surface of the pile (3). Acids produced at the surface are carried as if by a wick or sponge through the material down to the cuticle.

acids which cause the first partial decalcification there must pass through the intact membrane to reach the enamel.

NATURE OF THE BACTERIAL FILM OVER THE EARLY STAGE LESIONS

A film or pad of soft bacterial material of variable thickness is present on the surface of the tooth at all areas where it is protected from removal by functional or other friction. It is thickest where it is best protected. Microscopic examination of appropriate preparations of this material ("soft tartar") shows it to be composed entirely of bacteria, usually of many different kinds. (Figure 5). One character-



Fig. 5. Bacterial film material from over early stage caries lesion torn apart, stained, mounted in 50 per cent glycerin and photographed by transmitted light, shows filamentous nature of material.

istic of such bacterial material over early stage caries lesions (and elsewhere in most cases) is that it consists mostly of long rod and filamentous forms, one end of which is attached to the cuticle on the tooth. The rods and filaments extend outward, more or less parallel to each other, toward the surface of the pile or pad. At the surface there are the growing ends and fruiting heads of the long forms of which the deeper part of the film is composed (Figures 7, 8, 9); and among these, large numbers of other bacteria of many different kinds.

PRODUCTION OF ACIDS AT CARIES LOCATIONS

Food, as it is masticated, is thoroughly and heavily inoculated with many different kinds of bacteria in the saliva, derived from all the different locations within the mouth. The bacteria in such heavily inoculated food



Fig. 6. Ground section, unstained, through early stage caries showing bacterial film attached to surface of tooth and indicating parallel rod and filamentous organisms (1, 2) with growing ends and fruiting heads (3) at the surface of the pile. Photographed by transmitted light which causes the white chalky enamel to appear dark. Note lines of Retzius (4) enamel prisms (5) and feathery edge at deeper part (6).

material lodged and retained upon the constantly present bacterial film pad at favorable locations about teeth, multiply and, through the action of their enzymes, break down the material which serves as their culture media. Many bacteria, when growing in the presence of favorable carbohydrates, produce acids. Such acids produced by bacteria at the surface of the bacterial film or within it, are carried, as if by a sponge or wick, through the film to the cuticle through which they pass to the enamel beneath. If such acids are produced at the particular location in sufficient strength and over sufficient length of time, decalcification of the enamel occurs.

This decalcification is only partial, giving rise to the softened "white spot" caries lesion. The enamel is not completely dissolved by such weak acids in the same way as it may be, experimentally, by stronger acids. For instance, the enamel is completely dissolved and disappears (except for some remaining enamel matrix material) from a tooth immersed in 10 per cent HCl for an hour or two. On the other hand the enamel on a similar tooth immersed in 0.15 per cent HCl, even for much longer time, is not dissolved in the same way. Only partial decalcification occurs, similar to the partial decalcification of the "whit spot" caries. The enamel on the tooth becomes softer and may be broken up or crushed like a piece of chalk in much the same way as that of the early stage lesion may be. Anyone interested can confirm this observation by the simple procedure of immersing (suspending) tooth specimens in solutions of acid of the suggested strengths, for several hours (several days for weak acids).

What seems to be the same kind of partial decalcification may be produced experimentally by solutions of organic acids, such, for instance, as lactic acid—the one gener-

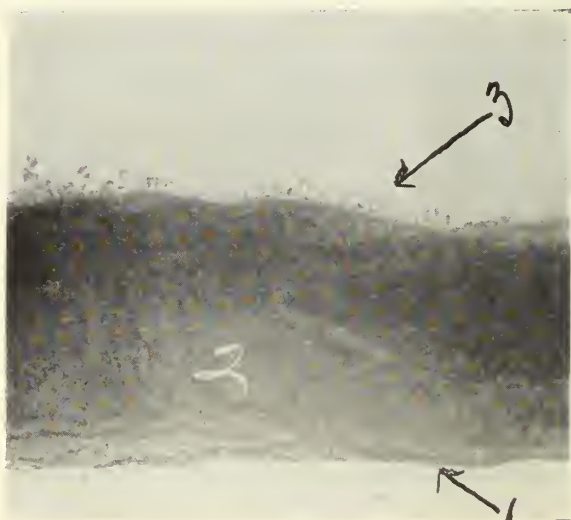


Fig. 7. Section cut through compact bacterial film pad removed from over white spot caries lesion. Note rods and filaments extending outward (2) from the cuticle (1) to which they are firmly attached and (3) fruiting heads of *Lep-tethrix racemosa* projecting at the surface.

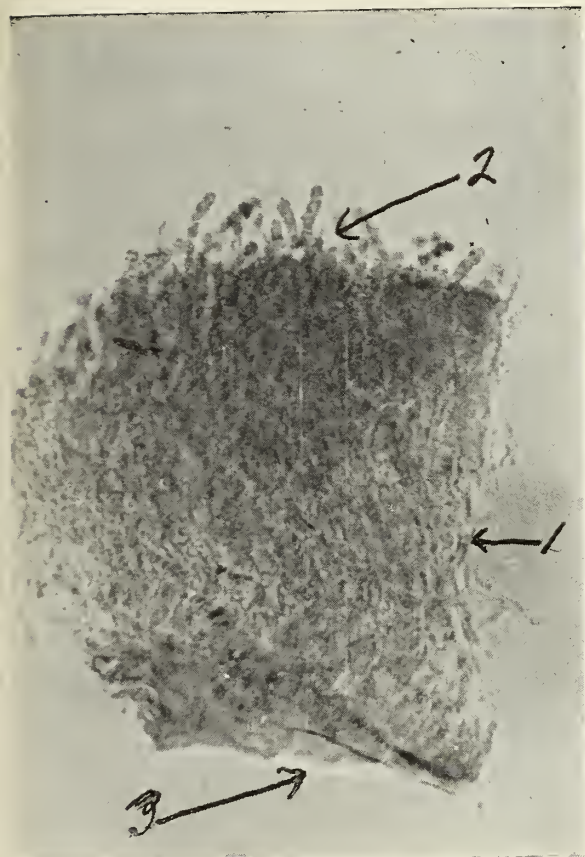


Fig. 8. Piece of the bacterial film from over early stage caries lesion. Specimen teased off, stained very lightly with safranin and mounted in 50 per cent glycerin for photographing by transmitted light. Note filamentous nature of bacterial material (1) and growing ends and fruiting heads at outer surface (2). Inner surface (3).

ally supposed to be the most important in caries production. However, weak solutions of organic acids, such as can be assumed to be formed at caries disposed locations, act very slowly. It is only after long continued exposure to such weak acids experimentally that demonstrable partial decalcification occurs. Likewise it is only after long continued and repeated production of acids by bacterial action, that a caries lesion results. It is very apparent that to prevent early stage caries at any vulnerable place on a tooth, it is necessary to prevent the formation of acids by bacteria growing there*

TIME FACTOR IN PRODUCTION OF ACIDS BY BACTERIA

Some bacteria grow and produce acids much more rapidly than others. However

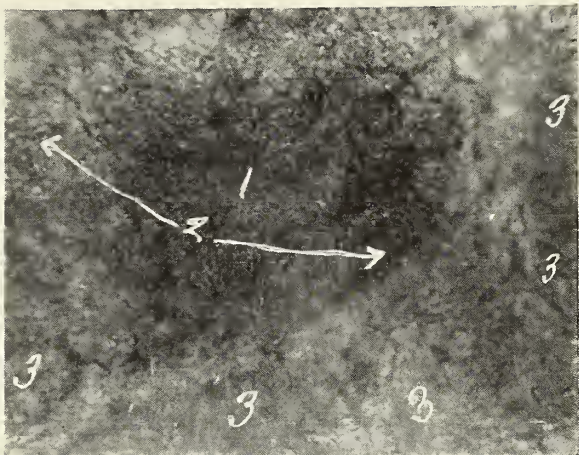


Fig. 9. Bacterial film pile on surface of tooth over early stage caries (chalky enamel) stained lightly with safranin and photographed with incident light. Note mound of *L. racemosa* (1) with some fruiting heads focused around periphery (2). Many more just out of focus.

any of them require considerable growing time, under the most favorable conditions, for production of appreciable amounts (or strengths). Perhaps the most familiar example for those who have been medical or dental students is the testing of acid production by pure cultures of different bacteria inoculated into litmus milk. Litmus milk is blue. A tube of such culture media inoculated with a loopful of a pure culture of an acid producing organism and placed in the incubator still remains blue for several hours, usually twelve or fifteen or more. After the necessary incubation time it will be noted that the color is changing to a faint pink and finally, within twenty-four hours or a longer period, to red, indicating production of considerable lactic acid from the sugar in the milk.

Stephan and Miller¹⁵ showed that brushing the teeth thoroughly before rinsing with 10 per cent glucose solution eliminated the

*Note: I am aware of the suggestion, belief or claim by recent authors (6, 7, 8, 9, 10, 11, 12, 13, 14) that caries is, to some extent, a proteolytic process by which the organic material of the enamel is invaded and broken down by the enzymes of proteolytic bacteria and that this is followed or accompanied by disintegration or decalcification of the inorganic material. The personal oral hygiene for prevention herein specified would be equally applicable to such order of events in the caries process.

fall in pH which otherwise would have occurred. They found that in testing plaque material *in situ* for pH drop following the glucose rinse, subjects who refrained from brushing their teeth for three or four days, thereby insuring a sufficient amount of bacterial material on accessible surfaces, gave most satisfactory results. Therefore a considerable period of time is required for sufficient growth and accumulation of bacteria to occur before much acids can be produced in the presence of carbohydrates.

However another factor plays an important role in the production of acid, i. e., the amount of inoculum or number of bacteria with which the culture medium is inoculated. If, for instance, a tube of litmus milk is inoculated with say 2 or 3 cc. of rich culture, containing enormous numbers of viable bacteria, instead of the loopful as suggested above, containing relatively only a fraction as many, then we find acidity developing and the color changing within a shorter time, sometimes only a few hours.

Applying the above elementary information to our problem of preventing acid formation and thereby preventing caries, it is evident that removing from about a tooth all food material which may serve as culture media for acid producing bacteria and removing from the same location most of the bacteria, there will be little growth of bacteria (for lack of culture media) and no production of acid (for lack of fermentable carbohydrates) until food is again lodged at the particular place and sufficient time elapses for bacteria to multiply and produce acid.

Decomposing food material that has been retained and has accumulated about the teeth during the daytime gives the bacteria growing there a good start towards acid production by bedtime. If these conditions are allowed to continue through the night during sleep the most favorable conditions exist for more rapid bacterial growth and production of acids, and their action upon the teeth. As a matter of fact, the caries process progresses principally at night and during sleep. Therefore to prevent the initiation and further progress of caries

the teeth must be effectively cleaned of food and accumulated bacterial material at night before retiring. Nothing else will suffice.

EARLY STAGE PERIODONTOCLASIA

Periodontoclasia begins and progresses as a local microscopic disease process. The earliest stage lesions are too small and inaccessible to be recognized except by microscopic examination of suitable sections or other preparations of the tissues involved. What is ordinarily diagnosed clinically as periodontoclasia (pyorrhaea) on the basis of flow of visible amounts of pus, receded periodontal soft tissue, alveolar resorption, pocket formation, loosened drifting teeth, etc., represents, in fact, the far advanced stage and results of a disease that usually has existed and progressed at the particular location for many years. Long previously, there was an earlier stage, actually a beginning, of the same disease about the same tooth. It is this earlier stage against which effective prevention must be directed. Measures for this purpose must be based upon clear understanding of the etiological conditions at the locations where the disease starts and from which the lesions about each tooth advance.

RELATION OF THE ENAMEL CUTICLE TO EARLY STAGE LESIONS

It has been shown² that the enamel cuticle bears an important relationship to the early stage of the periodontoclasia lesion. The marginal gingiva normally rests upon the smooth, non-irritating enamel cuticle. Bacteria allowed to grow and accumulate for a long time on the tooth at the gingival margin, tend, in time, to produce microscopic roughness and hardened concretion upon the cuticle. The tendency is for this to increase, not only encroaching upon the gingival margin but extending into the gingival crevices (Figure 10). In time a narrow portion of the free gingiva (the free gingiva is that portion extending occlusalward from the level of the bottom of the crevice) rests against a surface covered with hard concretion and a pack of soft bacterial material. The irritation caused by the presence of this foreign material upon the tooth, where normally smooth,

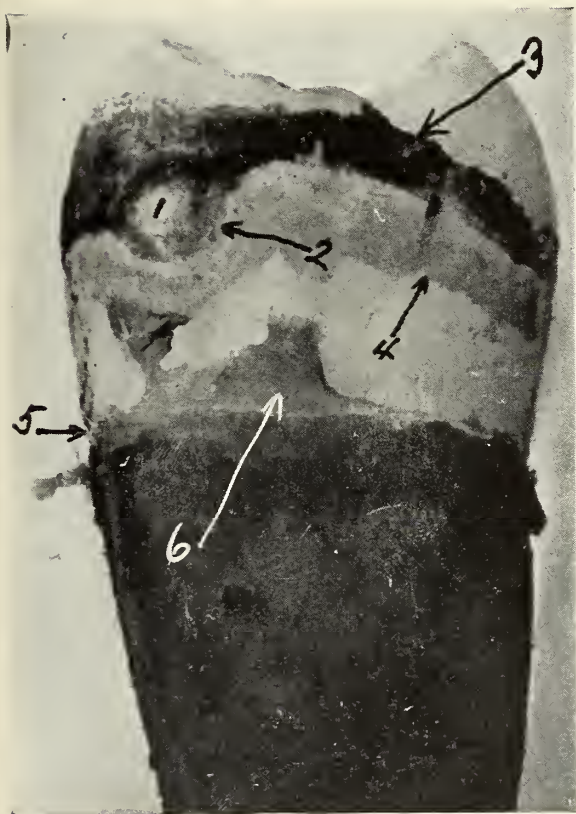


Fig. 10. Proximal of extracted tooth stained with crystal violet showing biconcave disc of bacterial material surrounding contact area, and heavy film which extended from the gingival border (gingival crevice) occlusalward. Contact point (1). Disc of bacterial film material surrounding contact point (2). Heavy bacterial material on area protected from functional friction (3). Epithelial cells remaining attached to tooth (4). Location of cemento-enamel junction (5). Some epithelial attachment tissue retained on tooth (6).

non-irritating cuticle exists, soon causes inflammation; at first only microscopic in extent. Minute and microscopic quantities of inflammatory exudate and pus cells are poured out through the inflamed tissue into the gingival crevice, and these tend to promote the growth of microorganisms and increase of the concretion. As the foreign material on the tooth increases and advances further into the gingival crevice, the soft tissues attached to the tooth are forced back by the accompanying inflammation and ulceration. Gradually and almost imperceptibly a larger and larger portion of

the tooth is exposed as the gingival margin moves further away from the occlusal level. The gum "recedes."

Many factors influence the progress of the lesions at different locations about a given tooth, about different teeth in the same individual and in different individuals. For our present purpose of prevention of the disease (lesions) and prevention of further progress of lesions that already exist, it is only necessary to adopt and direct effective measures against the conditions at and within the gingival crevice. The disease process involving the more remote tissues — periodontal membrane, alveolar bone — rapidly subsides as soon as the local lesions consisting of inflamed, suppurating and broken surface of the epithelial tissue of the gum within the crevice, subside and disappear.

From the earliest stage and continuously as the lesion progresses, the tooth surrounded by this concretion and bacterial material adhering to it within the gingival crevice is, in effect, a foreign body infected with many different kinds of bacteria. It is a suppurating lesion constantly exposed to invasion by any and all of the many different kinds of bacteria within the mouth which are capable of growing in such an environment.

This foreign body effect was recognized and emphasized as the cause of periodontoclasia more than seventy years ago by Dr. John W. Riggs.¹⁶ He supported his claims by the marked benefit and control of the disease he secured by removing this foreign material from the surface of the tooth and polishing it so it no longer caused the constant irritation and suppuration characteristic of the disease. The treatment had to be repeated frequently as the material soon reformed. How different it would have been if he and those who followed him could have had their patients carry out the personal oral hygiene procedure we now know to be possible and essential, thereby preventing the recurrence of the local conditions which originally caused and promoted the disease!

MATERIAL UPON THE TOOTH AND WITHIN THE CREVICE

In order to devise and adapt personal oral hygiene measures for prevention of the formation of the material upon the tooth which causes and promotes progress of the disease, correct conception of the nature of this material is necessary. We have already seen that the bacterial film (tartar) on the surface of a tooth above the gingival margin at the more protected places where it can accumulate and where it is not dislodged by functional friction (Figures 10,



Fig. 11. Proximal of extracted molar stained to show bacterial film. Contact area (1). Heavy bacterial film (2). Epithelial cells remaining attached to tooth (3). Location of cemento-enamel junction (4).

11), consists largely of a thick pad or pile of long rod and filamentous bacteria, one end of which is attached to the enamel cuticle. The other end extends outward to the surface of the film pack where there are usually an abundance of other bacteria of many different kinds.

The gingival margin must rest against this bacterial mass of foreign material which causes irritation, inflammation and suppuration. As the foreign material on the tooth builds up and advances into the gingival crevice (Figure 12) the inflammatory exudate there offers favorable environmental conditions and nutritive material for the growth of other types of microorganisms that do not grow outside of the crevice. They are organisms, such as certain leptotrichia, actinomyces, spirochetes, ameba, etc., which prefer or re-

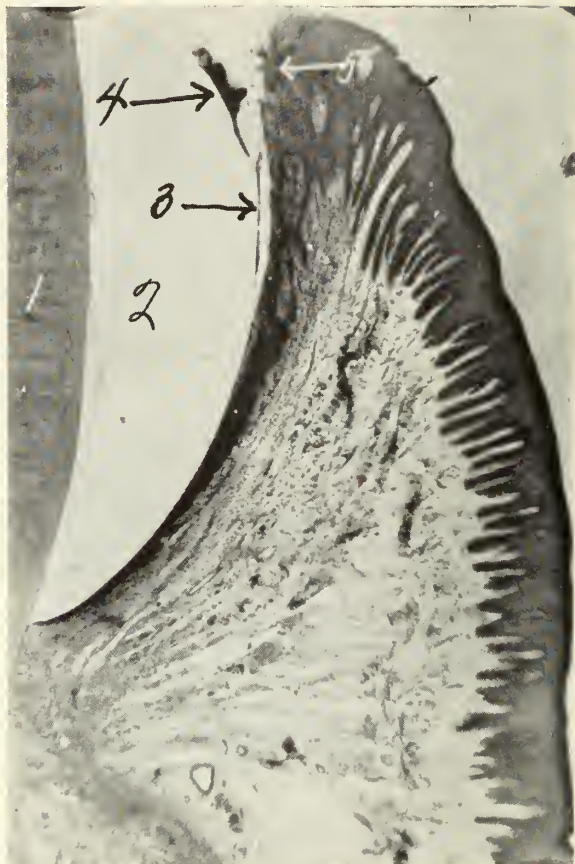


Fig. 12. Section through gingival tissue showing foreign material attached to cuticle within the crevice. The early stage of periodontoclasia. Dentin (1). Enamel space (2). Cuticle (3). Bacterial film and concretion on cuticle against which the inflamed free gingiva (5) must rest.

quire the more or less anaerobic conditions, inflammatory tissue exudate, blood and pus present in such diseased gingival crevices. After a lesion, although small, is well established at any particular location and any time thereafter during the advancement of the lesion, the surface of the tooth within the crevice against which the inflamed gingival surface rests, has more or less hard calculus on it at most areas. The inner border of such calculus approaches but usually does not quite reach the zone of disintegrating epithelial attachment cuticle,¹ a landmark that can be seen on extracted teeth and indicates the exact location of the outer border of the epithelial attachment. Superimposed upon and attached to the calculus and any part of the tooth on

which there is none, within the gingival crevice, there is a pad or pile of soft bacterial material. This bacterial film consists largely of closely packed parallel long rod and filamentous forms, one end of which is attached to the calculus or the tooth from which the rod or filament extends outward toward the surface of the pad against which the inner inflamed surface of the gum rests. At the surface of the bacterial film within the crevice there are growing ends and fruiting heads of the rods and filaments composing the pad, and among these more or less other bacteria that invade the lesion from the mouth. Among elements making up the film pad on the tooth within the gingival crevice perhaps the stems and fruiting heads of *Leptothrix falciformis* are the most noticeable and the most constant. This organism was first described in material from around teeth by Beust¹⁷ in 1906 and 1908. I⁵ have called attention to the fact that the habitat of *Endameba buccalis* is among the stems, branches and fruiting heads composing this film pack.

We do not know exactly what role any of the different microorganisms found in the gingival crevice play relative to disease there. Probably it is a very complex process. However it is clear that for the purpose of preventing initiation of the lesions of this disease and preventing further progress of lesions that have already been established, effective measures must be applied to prevent or minimize the growth and accumulation of bacterial material on the tooth at the entrance to, and within, the gingival crevice, which cause the disease (Figures 10, 11, 12).

Food material retained at the entrance to the gingival crevices and between the teeth, and packed into the crevices, promotes growth of bacteria there and increases inflammation of the tissues against which it rests. If food and bacterial material that has accumulated at and within the gingival crevices during the day is effectively removed at night before retiring, there follows a period of many hours during which there is greatly lessened bacter-

ial growth. Rapid subsidence of inflammation occurs. Therefore to effectively prevent the initiation and further progress of periodontoclasia lesions the teeth must be cleaned at and within the gingival crevices every night before retiring. Nothing else will suffice.

DIAGNOSIS OF EARLY STAGE PERIODONTOCLASIA

The periodontoclasia lesion begins at the entrance to and just within the gingival crevice, principally the interproximal crevices, the distal and mesial crevices about teeth where there is no approximating tooth and the crevices at the buccal, labial and lingual embrasures. At first the lesion is only microscopic in extent. Even then there are a few (often only microscopic quantities) pus cells passing through the inflamed inner surface of the free gingiva. These tend to accumulate just within the crevice and at the entrance to it. Material removed from within the crevice by proper technic, stained and examined shows some to many pus cells. There are no pus cells within uninflamed healthy gingival crevices. Therefore, the presence of pus in material from the gingival crevice is diagnostic of inflammation there. Likewise the absence of pus cells means absence of inflammation and absence of periodontoclasia.

Microscopic examination for pus is a very simple procedure. Material must be properly taken from the gingival crevice, spread upon a microscope slide and stained with some one of the many appropriate stains for such specimens. The material must be delicately scraped from within the crevice with an appropriate small instrument. Although some of the instruments usually used by dentists for other purposes may be used, the best results can be obtained with an explorer and scraper which the author first made from a D. C., R & L, Premierlite explorer (Figure 13). The blade is ground to a width of .55 mm. and suitably shaped for entrance and manipulation within the gingival crevices—especially the interproximal crevices. A cross section of the blade is half disc shaped. With it one can obtain small amounts of

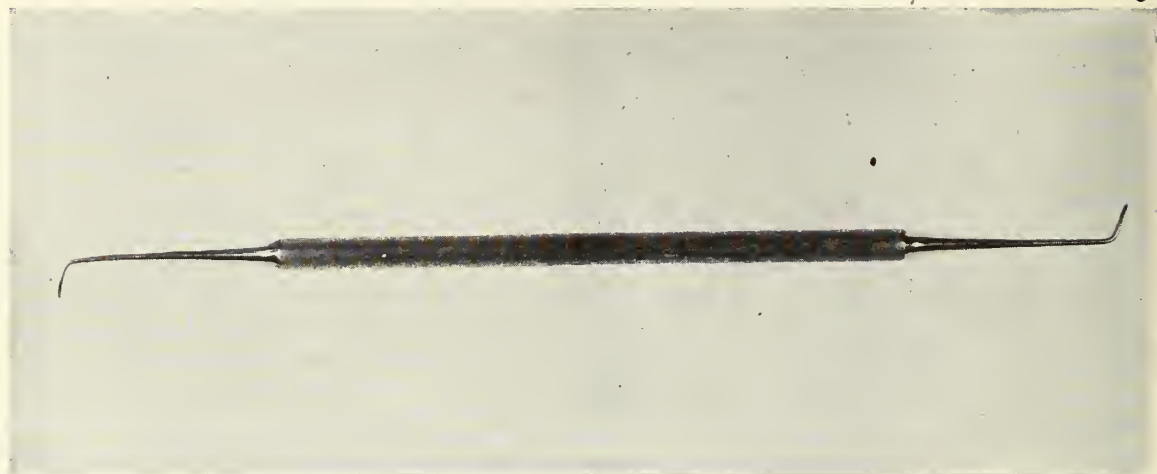


Fig. 13. Explorer and scraper ("Bass' 55") for exploring, scraping and securing material from gingival crevices and periodontoclasia lesions.

material from the inflamed surface of the gum within the crevice and from the very bottom of the space, where the disease is progressing. Success depends upon correct technic in collecting and preparing material for examination rather than upon collecting large amounts improperly.

The material is spread in a small area (2 to 5 mm. in diameter is enough) upon a microscope slide. Removal of the small amount of material from the blade of the explorer and spreading it upon the slide can be facilitated by the use of some kind of teasing needle or other small pointed instrument. Several such specimens from different crevices can be placed at different locations on one slide, and all stained and examined at the same time. The author usually mounts on one slide for examination all the specimens taken at a sitting from a given subject.

The slide is ready for staining and examination. Any one of many staining methods may be used satisfactorily. A good one for general purposes is as follows: (1) Fix with heat; (2) Carbol fuchsin one-half minute; (3) Rinse; (4) Crystal violet one-half to one minute; (5) Wash, dry and mount in oil for examination.

Pus and other cells are satisfactorily seen with the low power (16 mm.) objective. Higher powers and the oil immersion objective are needed for study of the bacteria, spirochetes and ameba *Endameba*

buccalis) that may be present.

WIDESPREAD PREVALENCE OF PERIODONTOCLASIA

Periodontoclasia is practically a universal disease. There are suppurating lesions about some or all of the teeth of all people except those who have learned and follow the necessary personal oral hygiene to prevent the disease. Anyone who is interested can confirm this by examining, as indicated above, material from his own interproximal gingival crevices, and from those of others.

Inflamed and ulcerated inner surfaces of the free gingiva bleed easily from the slightest force or manipulation. Uninflamed epithelial surfaces do not bleed. Therefore "bleeding gums" can be considered practically diagnostic of inflammation and ulceration—the early stage of periodontoclasia.

In view of the widespread prevalence of this disease it is hardly necessary, for diagnostic purposes, to make microscopic examinations for pyorrhoea, as suggested above. It can be assumed to be present about some of the teeth of practically all adults and most younger people. During a period of several years the author has examined a considerable number of people, mostly medical students and other university personnel. In no instance has he failed to find pus from some of the gingival crevices, and also one or more demonstrable lesions where some receding of the gingival

attachment has taken place. This experience, which will be confirmed by those who employ appropriate technic, indicates the extensive prevalence of the disease, the inadequacy of the oral hygiene procedures presently in general use and the need for a better method.

NECESSARY PROCEDURE

We may now state the fundamental facts to which the necessary oral hygiene procedure must conform and specify the procedure required. One of these facts is the time honored saying "a clean tooth does not decay." The other, more recent, is "periodontoclasia does not occur about a clean tooth"⁸ The author has formulated one sentence which comprehends what every person must know and do to save his teeth from these diseases and to maintain reasonable personal oral cleanliness. It is used as a slogan in teaching personal oral hygiene to others. Anyone who undertakes to teach others how to take care of their teeth (after learning how to take care of his own) will find this sentence of instruction useful and helpful. "*You must clean your teeth right with the right kind of both toothbrush and dental floss every night before retiring.*" No part of this sentence may be changed or omitted without impairing its completeness. In the light of present information, no part of these instructions may be disregarded or neglected by anyone except at the jeopardy of his dental health.

All other supposed preventive measures which conflict with, or are intended to supplement, what is comprehended in the above sentence, tend to confuse or detract from the personal oral hygiene that is essential for maintaining oral health and cleanliness. If the teeth are also cleaned partially or well at other times, this contributes to greater oral cleanliness, but under no circumstances may such cleaning at other times of the day take the place of the essential cleaning at night before retiring.

Heretofore the individual has not known exactly how to clean his teeth right and the right kind of toothbrush and dental floss

have not been available. Therefore he must be taught by someone who does know.

RIGHT KIND OF TOOTHBRUSH

The function of the toothbrush is to dislodge and remove from any and all areas on the teeth that are accessible to the application of the bristles of the brush as much as possible of the decomposing food and bacterial material that has accumulated and is retained there since the previous cleaning. This material is soft, often microscopic in amount and composed of microscopic particles (bacteria and food elements). Its presence and character can be ascertained only by appropriate microscopic examination. The most important places to be cleaned with the brush are (a) the occlusal pits and fissures, (b) the proximal surfaces in the sulci between teeth as far as the bristles may go and (c) the surfaces of the teeth within the gingival crevices wherever they are accessible to the application of the bristles of the brush.

Material is dislodged and removed by the digging action of the ends of the bristles when the brush is applied firmly against the places to be cleaned and moved back and forth with short strokes ("vibratory motion"). The brush must be pressed down hard enough to force some of the bristles into the pits, fissures, sulci and gingival crevices as far as their diameter will allow them to go. The bristles must be flexible enough to allow those that do not enter the deeper spaces at the moment, to be deflected and not prevent others from entering. They also must be flexible enough so they bend and do not injure the gingival tissue when applied directly to the gingival crevices, and manipulated so as to secure the necessary digging action to dislodge the foreign material on the tooth within the crevice. For the same reason the ends of the bristles must be round and smooth instead of sharp, jagged, chisel shaped and rough, as the bristles of so many current toothbrushes are (Figure 14). The shape, size and form of the brush must be such as to adapt it to the most practical and effective application and manipulation for the purpose for which it is used (Figure 15).

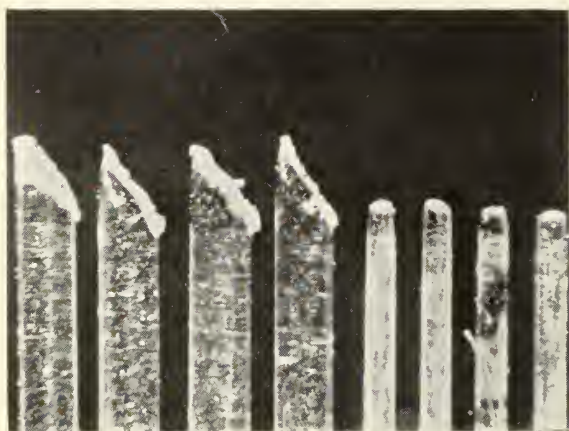


Fig. 14. Selected .014" bristles (left) from current toothbrush by the side of .007" bristles with smoothed and rounded ends from right kind brush.

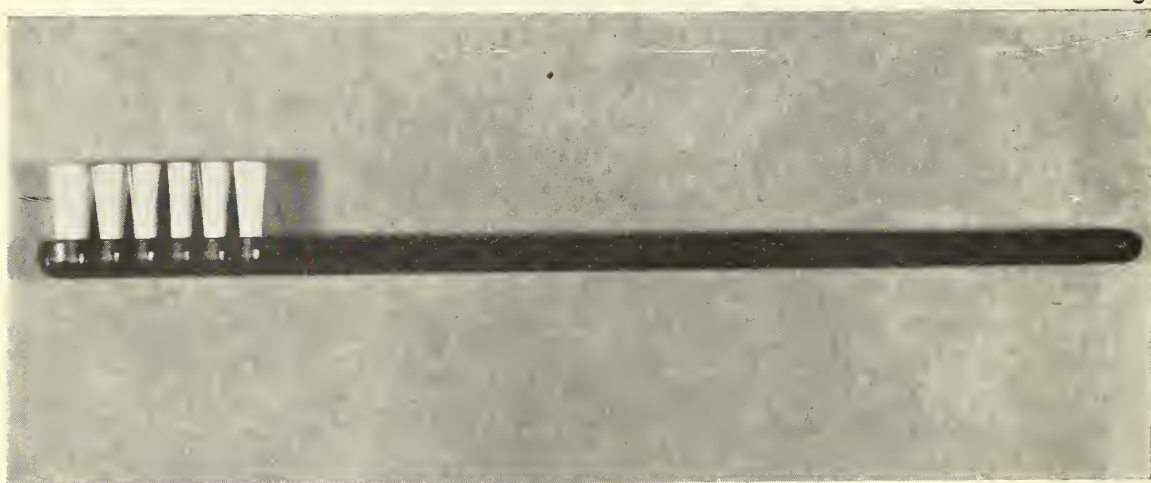


Fig. 15. Right kind toothbrush referred to in this paper and described elsewhere (3). Note straight handle and construction and straight trim.

Based upon much study of the spaces to be cleaned, the character of the material to be removed, and the conditions to be met, the author has specified elsewhere³ the optimum characteristic of toothbrushes for personal oral hygiene, giving the reason for each of the characteristics specified. The specifications laid down meet the requirements indicated above. This, and no other, is the right kind of toothbrush. In the light of present information any brush that deviates from the characteristics specified is less effective and less appropriate for the purpose, to the extent it so deviates.

The specifications for the right kind of toothbrush are:

1. Plain straight-handle design; over-all length about 6", width about $7/16$ "; 3 rows of bristles, 6 tufts to the row, evenly spaced (Figure 16).

2. High quality nylon bristles, about 80 per tuft, .007" diameter, straight trim, finished to $13/32$ " length.

3. Ends of bristles ground and finished to hemispherical shape or at least so as to eliminate all sharp points and rough edges.

4. A similar brush of reduced size for the use of young children should have an over-all length of about 5", .005" bristles, finished to $11/32$ " length.

BRUSHING THE TEETH

All the surfaces of all the teeth to which the brush can be applied, should be brushed. A good system is to brush the buccal and labial surfaces of all teeth first, then the occlusal and lingual surfaces of the grinders in all four quadrants and finally the lingual surfaces of the anterior teeth. The bristles of the heel of the brush can be applied most effectively to the lingual surfaces and the gingival crevices of these latter teeth. The bristles of the distal end or toe of this right kind of brush can be applied most effectively back of the last tooth in each quadrant by tilting the brush for



Fig. 16. Face view of right kind toothbrush, showing distribution of tufts.

this purpose at the same time the occlusal and lingual surfaces of the grinders are brushed. Anyone should be able to brush all of these teeth well enough for all purposes in less than one minute.

DENTIFRICES

The question of dentifrices necessarily arises. If one's hands are soiled with food and other objectionable material, he washes them with soap and water. A touch of soap (toilet soap) on the brush helps to clean similar material from the teeth. Nothing else is necessary for routine purposes.

The teeth of many people become stained with various substances such as tobacco, tar, certain stains in food and beverages, sometimes stains produced by chromogenic bacteria. Such stains are retained by the bacterial film but do not pass through it into the tooth. They may be removed and minimized by a mildly abrasive powder on the brush. Ordinary prepared chalk is effective. When used with the right kind of brush here suggested, it is harmless. It may be used as frequently as the individual requires. The teeth of some individuals stain much worse and in shorter time than others. Each person should use prepared chalk as often as necessary to prevent objectionable discoloration of his teeth. Some will require it every day, others only once in several days or longer.

The sweetening and strong mint or other

flavors which most dentifrices contain serve no useful purpose and are more or less harmful.

CLEANING THE PROXIMAL SURFACES

No matter how much or what kind of brushing is done, it is not possible for the bristles to reach and clean the proximal surfaces between the teeth. It is simply imagination to think otherwise. At the contact point the teeth are in direct contact and there is no space between them. For a variable distance extending outward from the contact plane in all directions there is a gradually widening space which is filled with a pack of bacteria, mostly long rod and filamentous type. This material has the form of a somewhat irregularly outlined biconcave disc (Figure 10) with the center corresponding to the contact point. When heavily inoculated food material is lodged upon the outer part of this biconcave disc where there are large numbers of growing ends and fruiting heads of the rods and filaments of which it is composed, acids may be produced there and may be carried, as if by a sponge or wick, deeper into the space. If the acid production continues long enough, ultimately there is partial decalcification—early stage caries—and later perhaps breaking down, cavity formation—advanced stage caries. In order to surely prevent these events it is absolutely necessary to clean the proximal surfaces of the teeth in this area every night before retiring. When done right this removes most of the bacteria and the food material in which they could grow and produce acids. There is not sufficient time from the time food is put in again the next day, for maximum growth of bacteria and for production of harmful amounts of acid, before time to clean the teeth again at night before retiring.

The only way now known, and the only way likely to ever be known, whereby the bacterial film on the proximal sides of the teeth can be removed is by the proper use of the right kind of dental floss. Elsewhere¹ the author has specified the optimum characteristics of dental floss for personal oral hygiene, indicating the necessity

or basis for each characteristic specified. This right kind of dental floss consists of 170 very fine filaments of high tenacity nylon. It is not waxed, and is only slightly twisted (3 turns to the inch). When drawn across the surface of the tooth, each of the 170 separate filaments is potentially capable of mechanically dislodging and removing some part of the microscopic bacterial material thereon. Also the bundle of loosely held together filaments is capable of receiving and holding in the spaces between the filaments (Figure 17), large numbers of microscopic particles (bacteria).

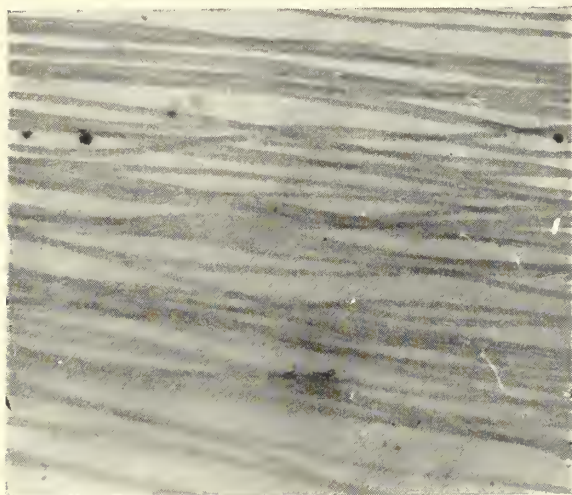


Fig. 17. Less than one-third the total number of nylon filaments contained in the right kind dental floss. Each separate filament, when properly used, is potentially capable of scraping off or dislodging some material and the many spaces between them can hold many microscopic particles, bacteria, etc.

NECESSITY FOR CLEANING THE TOOTH WITHIN THE INTERPROXIMAL GINGIVAL CREVICES

So far as proximal caries of the enamel is concerned, it is only necessary to clean the proximal surfaces of the tooth above the gingival margin or the papilla. We have seen that from the very earliest stage of periodontoclasia there is bacterial film and other foreign material on the surface of the tooth within the gingival crevice (Figure 12) and that this material is responsible for the initiation of the very earliest lesion and for the continued progress of the disease. To prevent the beginning and progress of the inflammation and

suppuration which characterizes the disease it is necessary to clean these areas of the teeth within the crevices. This can be done well enough with the right kind of dental floss mentioned above but it cannot be done in any other practical way now known. The surfaces of all teeth within the interproximal crevices of contacting teeth, and those within the distal or mesial crevices where there are no contacts, must be cleaned. This is accomplished by carrying the floss down to the very bottom of the crevice, holding it against the tooth and drawing it slightly endways and outward so as to scrape the surface. The bacterial material is dislodged and much of it is held and removed within the spaces between and around the filaments (Figure 17) of the floss.

DETAILED DIRECTIONS FOR CLEANING THE TEETH RIGHT WITH THE RIGHT KIND OF DENTAL FLOSS

While different people may develop their own technic and manipulations for cleaning their teeth with dental floss, the following procedure is probably the most practical and effective:

1. Cut off a piece of floss about 2 to 3 feet long.
2. Wrap one end with 2 or 3 turns around the first phalanx of the right index finger, for the purpose of anchoring or holding it. (Figure 18).
3. Bring the floss over the end of the right thumb which is also held against the finger around which the floss is anchored. (Figure 18).
4. Grasp the floss with the left hand and bring it over the end of the first finger of that hand. Thus a length of floss, about 1 inch long, is held between the thumb of the right hand and the first finger of the left hand. (Figure 18 (1)).
5. Now with the thumb inside of the cheek and the finger inside of the mouth, the floss is carried to the very bottom of the gingival crevice back of the last right upper tooth, drawn slightly endways through the crevice and crossways outward across the distal surface so as to scrape off and dislodge the soft bacterial material on the tooth within the crevice and outwards.

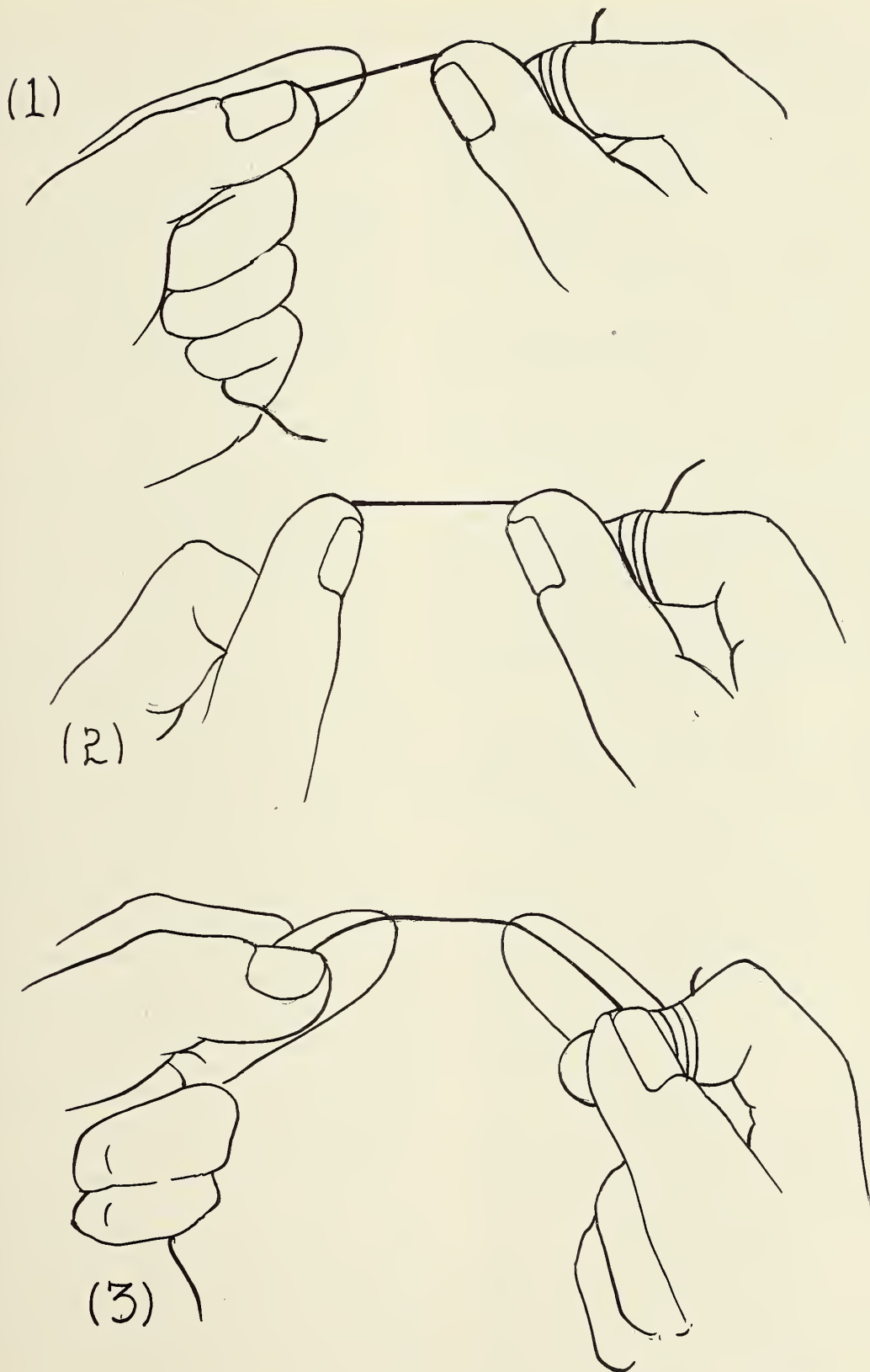


Fig. 18. Best way to hold floss in cleaning the teeth. For upper right (1). For upper left (2). For lowers (3).

6. Holding the floss in the same way, pass it into the next interproximal space. Carry it to the bottom of the posterior gingival crevice and clean the mesial surface of that tooth. Now, before withdrawing the floss from this interproximal space, clean the distal surface of the other tooth in the same way. Then withdraw the floss and move on to the next interproximal space, etc., until the proximal surfaces of all teeth have been cleaned.

7. In passing the floss between contacting teeth it is not forced directly in and out. It should be held over the contact and drawn gently and slightly back and forth endways. This allows the low-twist, unwaxed floss to flatten and pass between the contacting teeth with the greatest ease.

8. After cleaning 2 or 3 teeth the part of the floss used is somewhat soiled and loaded with bacterial material. It is desirable to move along the string to a new place by taking another turn around the anchoring finger. This should be repeated from time to time as needed.

9. The floss is held and manipulated with the same fingers as indicated above until after the surfaces of the teeth in the interproximal space between the left central and lateral have been cleaned.

10. In cleaning the rest of the upper teeth, it will now be found more convenient and practical to hold the floss over the ends of the thumb of the right hand as before and over the thumb (instead of the index finger) of the left hand. (Figure 18 (2)).

11. All the lower teeth now should be cleaned in the same way. Most people will find that they can carry out the necessary manipulations most successfully with the floss held over the ends of the second finger of each hand instead of the thumbs or the thumb and first finger as in cleaning the upper teeth. (Figure 18 (3)).

12. After cleaning all the teeth with dental floss, the mouth should be thoroughly rinsed by forcing water vigorously back and forth between the teeth in order to remove material that has been loosened or dislodged but not removed by the floss. After a little experience one can clean all

his teeth well with dental floss in from 2 to 3 minutes.

13. It gives a pleasurable sensation of cleanliness to hastily brush the teeth again after cleaning them with dental floss. But this is not essential.

RESULTS

The author has instructed and had under observation, a sufficient number of subjects to be able to state positively the beneficial effects that result from the personal oral hygiene herein specified.

1. No new caries lesions develop.

2. Early stage lesions (mostly unrecognized "white spot" partially decalcified enamel that has not broken down) do not progress further or break down.

3. Small shallow cavities do not progress but usually become inactive.

4. Correctly made fillings do not undermine or break down.

5. No new periodontoclasia lesions occur.

6. All early stage periodontoclasia lesions heal promptly. It is almost dramatic the way in which the bleeding from the gingival crevices stops entirely after the first few days. Pus (even microscopic quantities) is no longer present in material from most of the crevices, and greatly diminished in that from others. The delayed or incomplete healing in such lesions is usually due either to calculus or scale on the tooth within the crevice or to irregularities or other conditions on the surface of the tooth which prevent accurate application of the floss. In most such instances, removal of the foreign material from the surface of the tooth at, and within, the gingival crevice by the dentist, followed by the right personal oral hygiene, results in prompt subsidence of the disease.

7. Each advanced stage periodontoclasia lesion and deep "pyorrhoea pocket" is a separate problem. However, cleaning off the tooth at and within the lesion by the dentist at suitable intervals together with faithful application of the personal oral hygiene described herein usually will yield most gratifying results. The beneficial results will depend largely upon the extent of the lesion and the damage already done. In favorable

instances suppuration and inflammation of periodontal tissues subside, and loose, drifting teeth usually stabilize.

8. Foul odors from the mouth due to decomposition of food material about the teeth, to putrefaction of inflammatory tissue exudates within the crevices and to the growth of certain microorganisms (especially spirochetes) in the blood enriched material in the crevices, is avoided.

9. Much satisfaction is derived from the sense of oral cleanliness which one enjoys, after he once understands the conditions and learns how to clean his teeth effectively.

COMMENT

Every person who has teeth to save and everyone who desires to maintain reasonable oral cleanliness must learn and follow the personal oral hygiene procedure herein described. People go to dentists for treatment of the advanced stage of caries and periodontoclasia from which nearly all loss of teeth results. They do not know or properly evaluate the fact that the lesions, representing more or less irreparable damage, could have been prevented. Neither do they recognize the presence of existing earlier stage lesions, further progress of which can be prevented by personal oral hygiene. They need to be instructed.

Dentists should be interested in teaching this necessary personal oral hygiene to their patients not only for the purpose of prevention but also to greatly improve the success and durability of their treatment of existing lesions and conditions. To fill a cavity without making certain, at the same time, that the patient knows how to maintain the necessary cleanliness of the area in the future reduces, on the average, the usefulness and success of the work done. To clean the accumulations of foreign material from the teeth or to treat his periodontoclasia without, at the same time, teaching the patient how to keep his teeth clean in the future, greatly reduces the value of the service. The value of the periodical visit to the dentist for check up and "prophylaxis" is very greatly increased if the patient is also taught this necessary personal oral hygiene.

It is evident that the practicing dentist should teach the necessary personal oral hygiene to his own patients. However, to teach it he must first know it himself. It is axiomatic that one cannot teach what he does not know himself. Except for anyone who may have already learned how to clean his teeth right, as here indicated, the dentist who still has teeth left now has more or less suppuration within the gingival crevices, and therefore active periodontoclasia, about some or many of his teeth. This will be confirmed by microscopic examination of properly collected material from his interproximal gingival crevices. He is losing his own teeth from the same conditions for which his patients need advice and treatment. Until he learns and practices the necessary personal oral hygiene to save his own teeth, he is not very well prepared to instruct his patients how to save theirs. Therefore he should first learn and practice the right method himself. Then he will realize how necessary it is for his patients also and can instruct them correctly and effectively.

SUMMARY

The necessary personal oral hygiene for prevention of caries and periodontoclasia has been presented in some detail. It conforms to the two fundamental facts: "a clean tooth does not decay" and "periodontoclasia does not occur about a clean tooth." The essentials are embraced in the teaching slogan which the author has formulated, uses, and recommends that others use: *You must clean your teeth right with the right kind of both toothbrush and dental floss every night before retiring.*

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DIAGNOSIS OF TUBERCULOSIS*

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ADVANCES IN DIAGNOSIS AND TREATMENT

In the last decade there has been a tremendous change in the diagnosis and treatment of chest disease. Among the important advances in *diagnostic measures* are:

1. The widespread use of photofluorography and the increased use of x-ray, including section radiography, special positions, bronchography and the use of intravenous dyes.

2. There has been a better appreciation of the tuberculin and other intradermal tests.

3. Laboratory methods, especially culture technics, have been improved.

4. There has been increased use of special methods to secure sputum specimens, such as gastric lavage and bronchoscopic aspirations. The use of the bronchoscope as a diagnostic tool has become quite common.

5. There is much more knowledge of fungus infections in the lungs.

The principle advances in *therapy* have been:

1. The discovery and use of the antibiotics and the fact that the sulfa group, penicillin and streptomycin, are especially valuable in so many pulmonary infections.

2. Tremendous advances in chest surgery have been made in both tuberculous and in non-tuberculous disease. Resections for tumor, bronchiectasis and tuberculosis are rapidly increasing.

These advances have occurred concurrently. Most of the therapy improvements would be impossible without similar advances in diagnostic knowledge. The sum total of all of these results in more specific diagnosis and treatment. We formerly talked in anatomical terms, but with the development of specific treatment we must have specific etiological diagnosis. When the treatment of tuberculosis was for the most part bed rest, it was not likely to be fatal for some non-tuberculous patients to receive such treatment, but when we use such permanent methods as lung resection or thoracoplasty we must be sure that our diagnosis is correct. Also, there was a time when it made little difference whether or not a correct diagnosis was made for bronchiectasis or lung cancer. Now, however, with specific treatment for these diseases available, it is very necessary that they be diagnosed accurately and as soon as possible if therapy is to be successful. Also, it is a very grave injustice to label a patient as being tuberculous when he is not. Therefore, it is very important that when a positive diagnosis of tuberculosis is made, that it be correct.

The widespread use of the photofluorographic unit in routinely x-raying large groups of supposedly healthy people has discovered many persons with significant chest findings. It is a generally accepted practice to refer such suspect-cases to family doctors for follow-up and differential diagnosis. In order to prevent mistakes and loss of time a definite routine is advisable. Another by-product of the extensive tuberculin and x-ray surveys has been the revision of our ideas of the value of history and

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physical diagnosis. We know now that there is no reliable group of signs and symptoms that points absolutely to a diagnosis of tuberculosis. We have unexplained hemorrhage from tuberculosis, but also from bronchiectasis and lung tumor, not to mention heart disease and the many other causes. Pulmonary hemorrhage is practically always pathological and demands immediate and unceasing effort to find the cause, but it is not of sufficient weight per se upon which to base a tuberculosis diagnosis. The same applies to a history of pleurisy with effusion. A parenchymatous x-ray lesion is also not enough to justify a sure diagnosis, neither are persistent rales in the upper half of the chest. It is rare indeed to find rales in the upper chest without finding x-ray evidence. On the other hand, it is very common to have x-ray findings and no clinical findings. We know that patients who wait for signs and symptoms to develop before seeking medical advice usually have far-advanced disease. The careful family physician looking for tuberculosis among his patients conducts a case finding survey just as any public health agency would do, by routinely making tuberculin tests and x-ray films of the reactors. He must always think of the possibility of tuberculosis. This is the only way that minimal cases may be found with any consistent degree of success.

To establish a positive diagnosis of tuberculosis the following criteria must be considered:

1. Positive tuberculin test.
2. Positive sputum on smear or concentrate.
3. A positive gastric culture. Cultured acid fast bacilli must be proven pathogens.
4. X-ray shows a parenchymatous lesion.
5. Pleurisy with effusion is present.

TUBERCULIN TEST

The tuberculin test should be *positive*. If this test is not positive, tubercle bacilli must have been found in the sputum. The tuberculin test should be an intradermal one. The best dose seems to be .0001 mg. P.P.D. or 0.1 mg. of old tuberculin. There is a difference in strength of tuberculin as prepared by different commercial houses.

Clinicians should select a tuberculin with which they are familiar or can become familiar and stick with it. We have found that purified protein derivative is fairly satisfactory and have now used it for several years. The dose of .0001 mg. is an intermediate strength which many surveys and studies have shown is probably the critical test strength for this product. To make this dilution the two tablet, second strength package is purchased and one tablet diluted with one-half "cc" of the diluent as directed. Then add the one-half "cc" to a 20 "cc" vial of buffered diluent. This makes a slightly higher dose than .0001 mg. per c.c. but not enough to make any difference. The two tablet package and the buffered diluent can be purchased in any good drug store supplying physicians so should be readily available for everyone. In our experience practically every active case of tuberculosis will react to this test. I do not believe that higher strengths are helpful. It is true that sometimes we get reactions to higher strengths but most of these are atypical and unless one is skilled in interpretation, are hard to read. A positive test with .0001 mg. must have an area of real edema at least 5 mm. in diameter and should have some erythema surrounding it. If there is no edema, the test is negative. If you feel that the test is doubtful or is a false negative, purchase new material, make a new dilution and retest using the same strength. The patch test is all right if positive, that is, one or both squares show good firm edema with erythema surrounding it, but a negative patch cannot be relied upon as much as a negative P.P.D. Solutions must be reasonably fresh. The manufacturers advise that P.P.D. always be made up fresh, but we routinely use solutions two to four weeks old. A positive tuberculin test always persists over forty-eight hours, and some men prefer to read at seventy-two and ninety-six hours. If a patient has a negative tuberculin test and has active tuberculosis, the disease is practically always quite far advanced and there is evidence of toxemia, including fever. Most always there are clinical signs

and ample x-ray evidence. There is usually no difficulty in finding tubercle bacilli in the sputum. Therefore, it is safest to call non-reactors non-tuberculous unless acid fast bacilli can be demonstrated.

ACID FAST IN SPUTUM

Acid fast bacilli should be demonstrated in sputum. One of the greatest needs for good tuberculosis work is a good laboratory. There are very few physicians in practice who are competent to do reliable sputum examinations. Many hospital laboratories are also not competent. There are however, some laboratories in practically every state which do good work. Also, in many states the State Board of Health has established either central laboratories or a central, plus branch laboratories, in various sections of the state to which sputum specimens may be sent. Accurate examinations are so important that without reliable information we are hopelessly at sea and we have to abandon 1948 standards and go back twenty years. Sputums should be collected in a sterile jar for a long enough period to secure at least an ounce, if possible. Sputum that is raised early in the morning is the best and the patient must be cautioned to save only that which he feels certain comes from his lungs. Ordinarily, not over a three day sample is desirable for one specimen and for some patients even a three day specimen is not very much. Most laboratories use some sort of concentration method and for this a larger amount is needed than for a simple smear. If only a very slight amount is obtained, a simple smear can be done.

GASTRIC CULTURES

Gastric cultures should be positive for acid fast bacilli and these bacilli must be proven to be pathogenic. Gastric aspirations are easy to do and should be done when there is no sputum or it is scanty. Early in the morning, before breakfast, before food or drink is taken, pass a duodenal tube by the nasal or oral route and aspirate stomach contents. If very little can be gotten add 25 to 50 cc of sterile normal saline and aspirate. The material obtained must be sent to a competent laboratory and examined within a few hours. Good tech-

nic for shipping specimens has not yet been standardized and this is a great weakness of the method. Gastric specimens should always be cultured. If acid fast bacilli are grown, animal inoculation should be done as non-pathogenic acid fast bacilli are often found in gastric washings.

THE X-RAY CHEST PICTURE

The x-ray should reveal a parenchymal lesion. The most typical lesions are usually in the upper half of the chest. Very, very seldom do we find positive tuberculosis with no evidence of an x-ray lesion. We have long been in the habit of making a diagnosis of tuberculosis by x-ray alone and even of trying to gauge activity. The x-ray is certainly one of the best methods of diagnosis but we must remember its limitations. After all when we look at an x-ray film we are looking at shadows. For some types of shadows we can be absolutely sure. For another group we can sometimes feel positive and for certain types we can only guess. One of the greatest difficulties that practitioners have is to make good films. It is possible to secure films of very good quality with low powered apparatus but strict attention to technical details must be given. The average film sent in for review is usually over-exposed and under-developed or under-exposed and over-developed; has usually not been washed long enough, often is scratched, marked, or the cassette is dirty, or one of many other imperfections can be seen. It is very difficult to make an accurate diagnosis with poor film. Many men seem to think that this is a detail not worth looking into.

PLEURAL EFFUSION

For many years we have regarded idiopathic pleural effusions as definitely tuberculous and there is no reason to change this idea now. If you are a purist you may say that this is tuberculosis of the pleura and not of the lung. Or you will not know whether to call this a minimal or a moderately advanced disease. At first when the effusion obscures the lung it may be impossible to tell whether or not parenchymal disease is present. When the effusion has subsided, further information may be had. However, regardless of these various dis-

tinctions it is always best to call every idiopathic effusion tuberculous and the patient should be treated as such. The new British classification divides tuberculosis into respiratory and non-respiratory. Pleural effusion is in the respiratory group.

To summarize these criteria, a positive diagnosis of tuberculosis may be made if number one, a positive tuberculin is present, plus five, pleural effusion. If number one, positive tuberculin is not present, number two or three, that is, positive sputum on smear or concentrate or positive gastric, must be present, plus four or six. It is rare to have a positive sputum without some x-ray evidence. In sputum examinations, acid fast bacilli are usually reported as rare or many or numerous. Sometimes in a series of ten or twelve sputum samples, one sample will be reported as positive rare. In such cases it is best to have other evidence before making a positive diagnosis. The British disregard the single rare positive. We always do gastrics on such patients and disregard if gastric cultures are negative. We should get more than one positive gastric.

There is one important exception to these criteria. In some hospitals or in some practices, routine tuberculin tests are made at regular intervals followed by x-ray studies. If a patient known to be a non-reactor to tuberculin changes to a reactor (and when change occurs the reaction is usually distinct) and a *persistent* parenchymal lesion appears, a positive diagnosis of tuberculosis is allowable. This patient should have treatment for tuberculosis. Treatment is usually bed rest and there is ample time for further diagnostic procedures.

It is perfectly safe that all patients that meet the criteria given above can be treated for tuberculosis, by definitive treatment and if possible they should be hospitalized in sanatoria. We are safe in doing pneumothorax, thoracoplasty or using any therapy that seems indicated. Patients fulfilling these criteria should be labeled tuberculous and should be reported to the health department.

TUBERCULOSIS SUSPECT

The next classification is that of *tuberculosis suspect*. This is a difficult classification and this diagnosis should be explained. It includes many that are often now positively diagnosed. When we make a diagnosis of "tuberculosis suspect", we strongly suspect tuberculosis. We cannot make this diagnosis and be complacent about it. In other words, when this diagnosis is made it means that continued study and observation be actively carried on until the diagnosis is clarified. In order to do this it may be necessary to hospitalize the patient for several days or even weeks and in many instances he should be sent to a tuberculosis hospital for special studies. However, when admitted to a hospital for study he should be admitted as a *tuberculosis suspect*. The criteria to be considered in making a diagnosis of tuberculosis suspect are:

1. Tuberculin test is positive.
2. The sputum is negative for tubercle bacilli to smear and concentrate.
3. The culture from gastric lavage is negative.
4. The x-ray shows some parenchymal lesion.
5. Cavity is present.

It is best here to qualify sputum and gastric washing examinations. Our usual routine is to examine three consecutive specimens of sputum. If enough sputum can be collected in a daily sample for concentration, daily specimens may be checked. If this is impossible three three-day specimens are examined. If these are negative or if there is no sputum, three consecutive gastric washings are obtained and cultured. Since it requires approximately four to six weeks before cultures can be read another series of three or even six sputum specimens may be collected and examined.

Tuberculosis suspects should be divided into two main divisions. Group A—those with evidence of toxemia, and Group B—those with no toxemia. As has been said before, the safety of this diagnosis, that is tuberculosis suspect, depends entirely upon the adequacy of the sputum examination. If one is not sure of the laboratory, such patients had better be sent to the sana-

torium or some hospital where adequate studies are available. A patient is placed in this category because study is necessary. He must not be forgotten or neglected. He must be given a very careful complete examination. This examination includes history, chest examination, and other laboratory tests. The presence of fever, pulse acceleration, increased sedimentation rate, rales in the chest, or other abnormal physical findings are evidence of an active pathological process which must be identified. Such evidence of toxemia may or may not be produced by tuberculosis. If one of the many acute infections is responsible, rapid improvement is usually the course. The most common chronic diseases which cause confusion are bronchiectasis, lung cancer, lung abscess, virus pneumonias slow to clear, and various fungus infections. To complete the diagnosis it may be necessary to do bronchograms and bronchoscopic examinations. Serial x-ray studies, seven to ten days apart at first and at wider intervals later are a *must*. Additional sputum studies should be made at least once a month or at six-week intervals. It is usually possible to make a definite diagnosis on these patients with evidence of toxemia in from a month to three months. In that length of time we should be reasonably sure whether the case is tuberculous or not. Patients with a cavity in the upper lung fields are almost always tuberculous and must be studied carefully. It may take some time to get positive sputum, but careful examination will usually disclose bacilli.

The B Group is the group of patients with no toxemia and may present a different picture. Active tuberculosis may be present with little or no evidence of toxemia as measured by clinical findings. The same applies to lung cancer. In this group the same exacting sputum studies and other investigations are in order and serial x-rays are needed. However, in many of these, if after three months of careful observation there has been no change in any of the clinical criteria, if for example, the x-ray shadow has remained the same and there is no evidence of toxemia—the patient may be

allowed to go a longer time before another check-up. Intervals may be lengthened to three months or six months. This is the type of case that may be picked up on routine x-ray surveys with an old healed lesion which has long ago been arrested.

There is no known safe rule as to how long patients should go between examinations. If one suspects that tuberculosis might become active, six months is long enough, as a great deal can happen in this period of time. However, all of us familiar with the follow-up of old patients know that there does come a time when infrequent examinations are adequate. When one is convinced that the lesion is inactive, a diagnosis of probable pulmonary tuberculosis, arrested, is safe, but unless at some time a definite diagnosis of pulmonary tuberculosis has been made a diagnosis of pulmonary tuberculosis arrested is not justified.

NON-TUBERCULOUS

The next classification is non-tuberculous. To be sure that a patient is non-tuberculous, first the tuberculin test must be negative. Second, no tubercle bacilli can be demonstrated in the sputum either by sputum concentrate or gastric culture.

Certainly, most patients who have a positive tuberculin test do not and probably never will have active tuberculosis. When a patient does have a positive tuberculin test he should have an x-ray of the chest. History of exposure should be obtained if possible, and if there is any history of exposure within the past two years, he should be re-examined from six months to a year. In clinic practice, a patient with a positive tuberculin test with no exposure to a known case for two years is discharged from the clinic if no x-ray or clinical evidence is obtained. It is known that some of these patients do develop tuberculosis in later years, but the number is insignificant and it is too expensive to follow the entire group. In family practice the physician can keep records of his tuberculin reactors and as a patient returns for various reasons, the chest can be checked as a part of routine studies. Such patients should not be called tuberculosis suspects and they can be given

a clean bill of health for practical purposes, but as their family physician we make a note on their chart not to forget the positive tuberculin.

The patient with a negative tuberculin test and no evidence of toxemia and no physical findings and no x-ray lesions and no acid fast bacilli, can be discharged as definitely non-tuberculous with no medical follow-up needed.

The patient who has a negative tuberculin test, who has a negative sputum, but does have evidence of toxemia or physical findings or x-ray evidence of pulmonary disease should be followed as a general medical problem until the diagnosis can be definitely made. The negative tuberculin test and negative sputum examination fairly well excludes tuberculosis but occasionally follow-up will find that acid fast infection is present. The best examples of this are sarcoid patients who may later develop clinical tuberculosis.

SUMMARY

It is obvious that in the diagnosis of tuberculosis the three principle tools are: (1) The tuberculin test. (2) The x-ray. (3) The sputum examination.

The sputum examination is probably the most important. The tuberculin test is easy to do and x-ray studies can be done fairly easily since equipment is now available in most communities of any size. The great difficulty with x-ray is the poor technic often used. The third part of the study, the sputum examination, *can be done* in remote places but good sputum studies require training, and persistence, and time.

It must be emphasized again and again in tuberculosis work that since we are dealing with an infection we should demonstrate the etiological agent. I do not believe that it is justified to do pneumothorax unless a positive diagnosis can be made. The family physician who has the problem of the follow-up of the survey cases in his own practice, has a great responsibility. If he delays in making the diagnosis all opportunities for good therapy may be lost. He must always remember the possibility of lung cancer being present and that it may masquerade as

any other chest condition. Unless the diagnosis is made extremely early there is no chance of successful treatment. He must remember that on survey films many tuberculous lesions are found in minimal stages. If he dilly dallies with the diagnosis and lets the case become moderately advanced or far advanced, there was no use in making the original survey. He should not wait for symptoms to develop before a diagnosis is made. Likewise bronchiectasis should be recognized early. Thousands of children are labeled as chronic bronchitis or sinusitis for years before the true nature of the disease is appreciated.

The chest x-ray is the best screening procedure. Every hospital admission should have this study and it has a high priority in the list of procedures to be carried on in an office practice. With tuberculin tests, routine x-rays, and sputum examinations for every patient who brings up sputum, the family physician will find that he will make many more diagnoses of tuberculosis than he has in the past.

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PENICILLIN IN THE TREATMENT OF PEPTIC ULCERS BY CONTINUOUS GASTRIC DRIP*

RICHARD W. YOUNG, M. D.
BATON ROUGE

Since June, 1946 I have been treating peptic ulcers by continuous penicillin gastric drip with a startling degree of success. To date I can report a series of 54 cases treated by this method. Of the 54 cases, 3 were prepyloric ulcers, 51 were duodenal ulcers. No gastric ulcers were treated. This was purposely not done because of the danger of cancer existing in this type of ulcer. Of the 54 cases, 53 gave x-ray evidence and symptomatic evidence of healed ulcer. Three had difficulty in taking the treatment the first time for various reasons. One passed a kidney stone and it was necessary to stop treatment; however, since then, he has successfully taken the treatment. Two

*Presented before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, Louisiana, April 14, 1948.

developed a penicillin rash and it was necessary to stop the treatment. Since then, however, one has been carried successfully through the ten days treatment by using Benadryl. Of the 53 cases discharged as cured none has had a recurrence to my knowledge. The oldest case was discharged from the hospital June 18, 1946.

The method used in these cases was to first establish the existence and exact location of the ulcer by x-ray and fluoroscopic examination. A #12 Levine tube is then passed to the stomach via the nose and fixed in position by tape to the nose. The stomach end of the tube should be at the junction of the lower and middle third of the stomach. The outside end is attached to a 1000 c.c. Abbott drip bottle suspended from an infusion stand. The formula I have used from the first case has not been changed and is as follows: 200,000 units of penicillin dissolved in 1000 c.c. of tap water to which is added 2 drams of soda bicarbonate. This is regulated to drip continuously at the rate of 60 drops per minute which averages 3 bottles in 24 hours. In all cases it is continued night and day for eight, ten or fifteen days. Of the 53 cases successfully treated, 5 were dripped eight days, 45 were dripped ten days, 2 were dripped eleven days and 1 was dripped fifteen days.

In the first few cases nothing was given by mouth at all and daily infusions were given of 5 per cent glucose in 1000 c.c. of normal saline. However, as I found out more about these cases I began to allow the patients to be up during the day as this seemed to eliminate bed weakness. They were then given 10 per cent glucose every other day and allowed to have a glass of sugar water once or twice daily.

The use of vitamins and amino acids was not found to benefit too much. The patients to whom this was given complained of hunger which in turn caused the HCl. content of the stomach to rise and, for this reason, their use was abandoned.

At the end of the treatment x-rays were made again on each case. Of the 53 cases

completed, x-ray evidence of healed ulcer was found.

The criteria for time of drip duration were the original size and duration of the ulcer and daily gastric analysis. Samples drawn from the stomach every morning show a rapid fall in the total and free HCl. the first three days to no HCl. and 4 to 12 total acidity and remaining so throughout treatment unless some disturbance occurs. In one case I noted a rise of HCl. on the fifth day and sixth day. I questioned the patient carefully and found he had been rinsing out his mouth with coffee. In another case a rise in HCl. was traced to chewing gum. All cases are taken off tobacco during the treatment. The obvious reason, of course, is to facilitate acid reduction. It is a well known fact that penicillin is partly destroyed by HCl.

An interesting observation was made early in this series of cases, and may be one of the important factors in its success. That is the cessation and absence of active peristalsis. It was noted at the end of ten days that barium from the first x-ray taken the day the treatment was begun was still in the colon with no apparent discomfort. All the cases having pain usually subsided entirely by the second or third day. In those cases with an extremely high acid content more than 2 drams of soda bicarbonate may be added at the beginning of the treatment.

The adjustment of the Levine tube is very important as the days pass by because the empty stomach will shrink and draw up. The tube, of course, will not shrink and is apt to slip out into the duodenum. This can be detected by daily sample taking from the tube or by fluoroscopy. Should bile appear in the sample, the tube should be moved up until it is again in the stomach at the junction of middle and lower third of the stomach. This step is very important; healing will not occur if the end of the tube is past the ulcer. This occurred in one case and the patient had to be dripped over under more careful observation, with a successful healing.

In conclusion, I would like to emphasize

that this form of application of penicillin has only been used on 54 cases and I, therefore, can only give it to you for what it may be worth. I do feel, however, that the degree of success obtained in this series is worthy of further study and use. The simplicity of the treatment and the lowering of the morbidity rate are the important factors in its favor. To date none of the cases reported has had a recurrence. No controls were run. Since the cases were seen in private practice, this was impractical. However, there was no mortality, a point worthy of recognition.

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SOME DATA PERTINENT TO THE DIAGNOSIS AND PROGNOSIS OF PULMONARY TUBERCULOSIS

PHILIP B. JOHNSON, M. D.†

AND

LOUIS A. MONTE, M. D.†

NEW ORLEANS

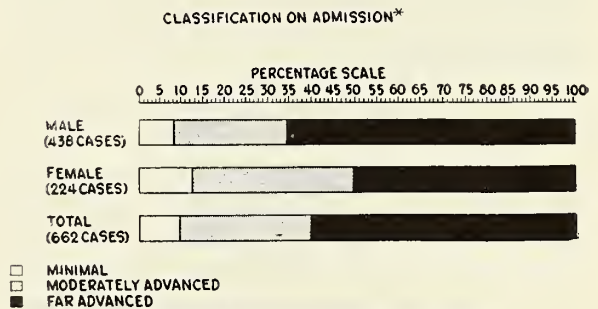
During a five year period ending in 1944, 662 patients with tuberculosis of the lungs were admitted to our unit of the Di-
bert Memorial (white) tuberculosis service of the Charity Hospital. In the great majority of the cases the disease had been recognized or suspected only a short time before the patients were sent to the hospital, or its existence had not been suspected prior to their admission. The patients were referred by physicians from all parts of the state of Louisiana. It is probable, therefore, that the relative numbers of cases of minimal, moderately advanced, and far advanced disease in this group of patients reflects with a fair degree of accuracy the stages at which tuberculosis was usually recognized throughout the state during this period.

Further, analysis of the clinical pictures presented by these patients and study of

the circumstances which led to the diagnosis should yield information which might be of value in the diagnosis of future cases, and which might point the way toward recognition of the disease at an earlier stage. Finally, observation of the courses of these patients after their admission and determination of their fates have shown us what we were able to accomplish in the treatment of tuberculosis in various stages of advancement.

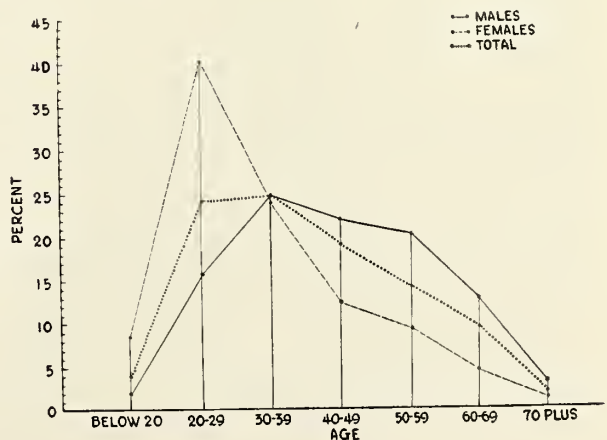
STAGE OF THE DISEASE

The extent of the pulmonary lesions (Figure 1) was minimal in approximately



* CASES OF BOTH ACTIVE AND INACTIVE DISEASE ARE INCLUDED.

10 per cent of the cases, moderately advanced in 30 per cent, and far advanced in 60 per cent. On the average, the disease was recognized at an earlier stage in women than in men, there being slight but probably significant differences in the incidence of each of the three stages. It is also of interest that on the average the disease had become apparent at a distinctly earlier age in women (Figure 2). It should



*Presented before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.

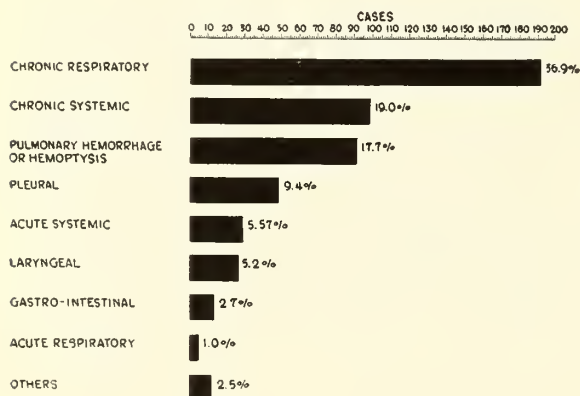
†From the Department of Medicine of the Louisiana State University School of Medicine and the Charity Hospital of Louisiana at New Orleans.

be noted that the curves for males and females cross in the fourth decade. Three-fourths of the women but less than half of the men were under the age of forty; 10 per cent of the females but only 2 per cent of the males were less than twenty years of age. In the entire group, half of the patients were older than forty years of age, and 13 per cent were aged sixty or above.

DIAGNOSTIC DATA

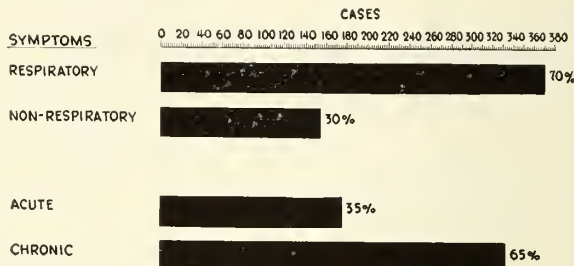
Adequate information regarding the symptoms or circumstances which led to the diagnosis is available in 583 of the cases. In 509 of these, tuberculosis was suspected on the basis of the symptoms of which the patients complained, but in 74 the disease was picked up "accidentally," this term here being applied to the detection of pulmonary tuberculosis by x-ray examinations of persons in whom there were no symptoms or signs which aroused the suspicion of the existence of this disease.

The most prominent complaints or types of symptoms in the symptomatic cases are depicted in Figure 3, in the order of the fre-



quency of their occurrence. Here it is noted that presenting symptoms were chronic respiratory in slightly over one-third of the cases, chronic systemic in one-fifth, onset with hemoptysis in about the same number, pleural in approximately one-tenth, acute systemic manifestations in approximately 6 per cent, hoarseness in about the same number, gastrointestinal in about 3 per cent, and acute respiratory in 1 per cent. It should be noted further that the prin-

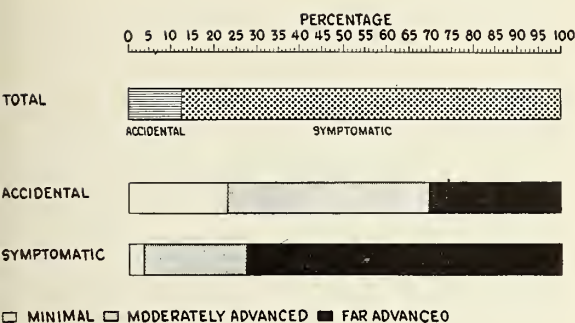
cipal complaints in almost a third of the cases were not suggestive of disease of the respiratory system, and that in about the same number the presenting symptoms were acute rather than insidious in onset. (Figure 4).



An attempt to relate the type of presenting symptoms to the stage of the disease revealed no definite correlation between the two, but it should be stated that in those patients who had symptoms due to tuberculosis the disease was at a minimal stage in only 4 per cent. Although no detailed study of the physical signs was made, it is relevant to state that examination of the lungs revealed only normal findings in nearly all patients with minimal lesions and in many of those with more extensive disease.

It should be of interest to record how the x-rays came to be made in the cases which were discovered "accidentally." Twenty-three cases were picked up during the course of studies for supposedly non-tuberculous disease, 23 during examinations for induction into military service, and 17 by x-raying persons known to have had intimate exposure to tuberculous individuals (contact studies); the other 11 cases were detected by x-rays taken prior to employment, following trauma to the chest or shoulder region, or for other miscellaneous reasons. In 1 patient who had undergone an appendectomy the discovery of tuberculous lesions of this organ led to the x-ray study, which demonstrated the presence of active pulmonary tuberculosis.

Figure 5 shows the percentage of cases picked up "accidentally" as contrasted with the symptomatic cases. Roughly 7 out of 8 cases were recognized on the basis of symp-



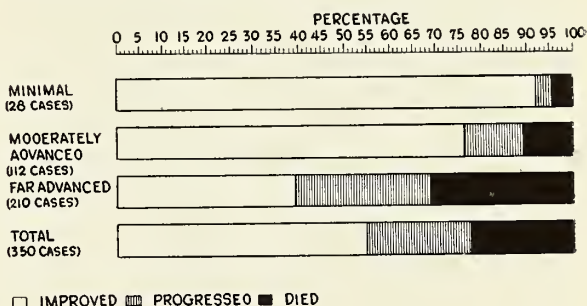
toms. The two lower blocks show the incidence of minimal, moderately advanced and far advanced disease in "accidental" (middle block) and symptomatic cases (lower block). It is seen that the incidence of minimal disease was much higher in the "accidental" than in the symptomatic cases, and the reverse obtains for far advanced disease in the symptomatic cases. The 17 cases of minimal disease picked up by accident or by routine x-rays comprise almost half of the total number of cases of minimal tuberculosis.

PROGNOSTIC DATA

The patients in this series were observed for periods varying from a few days to more than five years. During the periods of observation 176 patients died, giving a gross mortality of 30 per cent in the cases of active tuberculosis. The mortality in cases of minimal, moderately advanced, and far advanced disease was respectively 2½, 12, and 40 per cent.

Two hundred and thirty-three of the patients died shortly after admission or did not remain for treatment under our care for various reasons, leaving a total of 350 patients with active tuberculosis who lived more than three months and whose courses under therapy we were able to follow. Of these, the disease improved or became arrested in slightly over one-half, failed to improve or progressed in one-fourth, and was fatal to a fourth. Figure 6, which shows the results of therapy in these patients, reveals that the percentage of cases in which improvement or arrest occurred decreases from 90 to 75 to 40 as the stage of the disease advances, and that the mortality increases from 4 to 11 to 30 per cent.

Nearly all of the patients with minimal disease did well. On the whole, those with more extensive disease improved only when it was possible to effect collapse of the lesions by pneumothorax or thoracoplasty, but were able to accomplish this in only two-thirds of the patients with moderately advanced disease and about a third of those with far advanced lesions.



On the basis of previous experience, we estimate that among this group of patients the eventual mortality due to tuberculosis will be in the neighborhood of 50 per cent. We anticipate an ultimate mortality rate of about 10 per cent in the cases of minimal disease, 40 to 50 per cent in the moderately advanced, and about 80 per cent in the far advanced cases. The corresponding rates of eventual cure of tuberculosis we expect to be in the neighborhood of 90, 40 and 15 per cent. Cure in most of the cases of minimal disease will be effected by relatively short periods of rest, supplemented by pneumothorax of short duration in some cases. On the other hand, those with more extensive lesions who are fortunate enough to recover will reach the stage of apparent cure only after prolonged periods of absence from their homes and their work, and in most cases after prolonged or permanent collapse procedures have been employed.

DISCUSSION

If the results of this survey are applied to conditions which existed throughout the state during the period which it covers, it may be said that in most cases of tuberculosis the disease had progressed beyond a stage at which the chances of recovery were good before the disease was recognized. The cause of this delay in diagnosis is obvious:

It was not because physicians failed to recognize the clinical picture of tuberculosis, but rather because in most patients the disease had progressed beyond the minimal stage before significant symptoms appeared. This is apparent from the fact that although the first physician seen promptly made the diagnosis in the great majority of the symptomatic cases, the disease was already moderately or far advanced in 96 per cent of these cases. It appears that on the average, women may have sought medical advice earlier than men, which may explain the discovery of the disease at less advanced stages in females. The relatively large numbers of elderly persons is probably related to the small number of cases of minimal disease, or more specifically to the fact that many of the patients had had tuberculosis for a long time.

The obvious corollary of these results is the fact that tuberculosis in its early stages is usually not symptomatic, and that the disease can be detected while involvement is yet minimal only by x-ray studies of presumably healthy persons and of patients with symptoms which seem to be due to other conditions. The findings emphasize that acute as well as chronic illness may be due to tuberculosis, and that in many cases the presenting symptoms are not suggestive of trouble with the lungs.

It should be noted that there has been a slight but significant increase in the percentage of minimal, favorable cases admitted to our service during the past several years. A decade ago less than 2 per cent of the patients had minimal disease;¹ during the period of the present survey this had increased to 10 per cent. It is certain that the present programs of the State Board of Health and the Louisiana Tuberculosis Association will result in continued betterment of the situation, but in our opinion these programs can fulfill their purpose only if the practicing physician cooperates with them fully, and in addition carries on his own case-finding program among the persons who have chosen him as their medical advisor. If the doctor says to get an x-ray, it is made, but many persons are not

influenced by placards or other impersonal means of exhortation.

SUMMARY

Of the white patients with pulmonary tuberculosis admitted to our service during the period 1940-1944, approximately 30 per cent have already died, and we anticipate that ultimately at least half of them will die of tuberculosis. Only about 40 per cent will eventually reach the status of apparent cure. These poor results are in large part due to delay in the diagnosis of this disease, so that in the majority the lesions had progressed beyond stages readily amenable to treatment, before the disease was recognized. The cause of this delay lay not in the inability of physicians to recognize tuberculosis when it gave rise to symptoms, but to the fact that in its early stages it often produced no symptoms. The hope of increasing the recognition of tuberculosis in its early stages therefore lies not so much in greater suspicion of this disease in patients whose symptoms are compatible with its presence, but rather in establishing the presence or absence of tuberculosis (and other diseases of the chest) by x-ray-ing presumably healthy persons in increasing numbers at periodic intervals. The immediate hope of greatly increasing the number of cures lies not in any momentous advances in the methods of therapy, but rather in the recognition of more early, incipient cases. There is already a cure for minimal tuberculosis; there is no cure in sight for most of the cases of far advanced disease.

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DERMATOMYOSITIS*

REPORT OF A CASE

W. H. BROWNING, M. D.

SHREVEPORT

Dermatomyositis is not a rare disease. Several hundred cases have been reported. Yet, it is sufficiently infrequent and its manifestations are so variable, especially in

*Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.

the early stages, that a diagnosis may be easily overlooked.

The cause of dermatomyositis is not known. Several theories concerning the etiology have been advanced, but none has been substantiated. Banks¹ has emphasized that dermatomyositis, scleroderma, disseminated lupus erythematosus, Libman-Sacks syndrome and periarteritis nodosa, though unrelated in clinical features, have a close similarity in detailed pathology. He suggests that these conditions require evaluation for a possible relationship or a common denominator among them. McCombs and MacMahon² and Lowell³ in recent articles, have suggested that an allergic mechanism may be responsible for these entities. McCombs and MacMahon² point out that asthma and eosinophilia may occur in association with dermatomyositis. It has been suspected for some time that periarteritis nodosa is the result of or is related to the hypersensitive state.

The clinical and pathologic manifestations of dermatomyositis have been fully described in recent literature^{1, 2, 4, 5, 6, 7, 8, 9} The following case report will serve to demonstrate most of these manifestations.

CASE REPORT

Mrs. E. B. S., housekeeper, 66 years of age, came to my office on July 18, 1946.

Chief Complaint: Rash on face and forehead.

Present Illness: About June 1, 1946, patient developed a rash on her forehead. It was rather red, scaly, and itched. About a week later it spread to her face. Her face and eyes had been swollen on several occasions, and she had had severe urticaria twice during this interval. One week prior to my examination she had consulted a local dermatologist and had been given x-ray treatment.

Patient had been troubled with "acid stomach" for several years and on several occasions had consulted a local internist who never found any organic trouble but treated her with alkalies. At the onset of the present illness her digestive symptoms became worse. She described the symptoms as "something boiling in the abdomen".

During this illness she had experienced what she called heart attacks. The last one was two days before she consulted me. She had the sensation of the heart turning over and then stopping. Following this, she would become weak and break out in a profuse sweat.

For many years she had had "sinus trouble". She sneezed excessively upon retiring and upon

arising. The sneezing was in paroxysms. She coughed a great deal especially upon going to bed and upon arising. She coughed quite a bit during the night and had some wheezing and rattling in the chest. She had a troublesome postnasal drip and one nostril or the other was blocked most of the time. She had never had a severe case of asthma, but did have to sit up in bed at times because of coughing.

She had severe constipation and had been taking Ex-Lax for several years. Often she had frontal headaches which were not severe, but annoying.

Past History: She had severe urticaria as a child, but seemed to outgrow this except that she had an occasional urticarial wheal from time to time. After the onset of the present illness she had two severe attacks of urticaria. She had an appendectomy in 1921 and a tonsillectomy in 1931. She had not had any serious illnesses.

Menstrual History: Menopause at the age of 40. She was nervous and upset for about 10 years. She was the mother of several children.

Family History: Negative for allergy, cancer, tuberculosis, and heart disease.

Physical examination:

Temperature: 100.6° F. (Patient did not realize that she had fever.)

Blood Pressure: 170, systolic; 90, diastolic.

Weight: 126 pounds.

Skin: She had an erythematous, macular rash on the forehead, face, neck, chin, left ear, and scalp. These areas were covered with fine, light colored scales. The involved skin seemed to be somewhat endured.

Mouth: Teeth false, Mucous membrane normal.

Throat: Tonsils removed. Mucous membrane normal.

Nose: Mucous membrane swollen and red. Almost complete obstruction on right side.

Eyes: Pupils reacted to light and accommodation. The fundi appeared to be normal.

Ears: Used hearing aid. Drum membranes retracted. Left auditory canal red and scaly.

Sinuses: Right antrum slightly hazy.

Neck: No abnormal pulsations.

Heart: Approximately normal in size. Rhythm was disturbed by numerous premature contractions. Sounds were clear and distinct.

Lungs: Percussion note normal. Expansion free and symmetrical. Numerous coarse rales at the base of both lungs. Breath sounds normal.

Abdomen: Relaxed. Midline surgical scar. Generalized tenderness. No rigidity. Spleen palpable, smooth, and fairly firm. Liver palpable. Some ptosis of right kidney, but no tenderness over either kidney.

Glands: Thyroid not enlarged. Anterior cervicals, posterior cervicals, epitrochlears, inguinals, and axillary not enlarged.

Reflexes: Biceps and patella normal.

Laboratory Studies: July 18, 1946, Red cell

count 4,830,000; white cell count 6,600; hemoglobin 13 Gm.; polymorphonuclear leucocytes 50%; small lymphocytes 40%; eosinophiles 10%. Malaria plasmodia were present. Skin test and agglutination test for undulant fever negative. Kahn test negative. Fractional gastric analysis well within normal limits. Urine: Acid reaction, specific gravity 1.010, albumin 1 plus, pus cells 0 to 15/hpf. Sugar, bile, acetone, red cells, and casts negative. Another specimen of urine was examined on July 19, 1946, and it showed a trace of albumin and pus cells 2 to 5/hpf.

Impression:

1. Dermatitis from ingestion of phenolphthalein (Ex-Lax).
2. Malaria.
3. Urticaria, cause to be determined.
4. Perennial hayfever.
5. Allergic bronchitis.
6. Probable gastrointestinal food allergy.

An allergic survey was done. She did not react to pollens. Of the common inhalants she reacted to house dust (Endo) and wool. She was patch-tested with soaps, cosmetics, and other common contactants. Reactions were conspicuous by their absence. Food tests showed reactions to chicken, corn, lima beans, black-eyed peas, sweet potato, red pepper, grapefruit, tuna fish, and peaches. She knew that peaches and grapefruit caused urticarial wheals and gas and burning in the abdomen.

Progress: She was given quinine sulphate on July 22, 1946, 10 grains, night and morning. She became nauseated and vomited. After two days the dosage was reduced to 10 grains at night. She continued to vomit. The quinine was discontinued on July 29, 1946, and improvement was excellent. She did not have fever and the skin condition was clearing satisfactorily, but on August 7 she began to run fever again and was given Atabrine. The fever stopped and her skin cleared up except for a slight redness. She felt better.

She lived out of town, but reports by a daughter who lived in Shreveport indicated that she was doing well. On October 1, patient wrote that she had some "breaking out" on arms and feet, and that the feet were swollen. I advised that she come in for a check-up, but this was not done until October 29. At this time the arms and feet were clear. The skin of the face and forehead showed slight redness. She complained that her hair was falling out. The scalp appeared to be normal except for a few fine scales. Temperature was 98°F., blood pressure 150/80, weight 126 pounds. Liver and spleen were palpable. Urine: specific gravity 1.018, acid reaction, and otherwise normal. The red blood cell count was 3,210,000. Hemoglobin 7.8 Gm. White count 9,650. Polys 61%. Small lymphocytes 32%. Eosinophiles 7%. She was started on ferrous sulphate 0.25 Gm. t.i.d. She was, also, given suggestions about her diet.

A letter on November 5 stated that she was having fever ranging from 100° F. to 102° F. She complained of weakness and stated that the loss of hair was pronounced. She complained of numbness in the fingers. They turned pale and after the color began to come back it felt as though the bones would burst. During the morning of this date her entire body had turned extremely red and remained this way for thirty minutes. Other than this, the skin condition was very satisfactory.

About November 15, she began to swell. It was very bad in feet and legs, but by November 21 when patient came to my office she had edema of face, upper extremities, trunk, and lower extremities. She was not having fever. Urine: Specific gravity 1.018, albumin 2 plus, many pus cells; otherwise negative. Blood: Red cell count 4,160,000; hemoglobin 9.2 Gm.; white count 9,950. Polys 60%. Small lymphocytes 30%. Eosinophiles 10%. Total blood protein 8.8 mg. Albumin 2.9 mg. Globulin 5.9 mg. She was hospitalized and given Amigen intravenously daily for several days and was kept on a high protein diet. It was difficult to get her to eat meats. She was started on a vegetable diet in 1930 or 1931 because of "acid indigestion." To a large extent she had been on this diet ever since and had lost her desire for meats.

On December 4, after patient had slept under a wool blanket, the skin flared up. The rash was on face, neck, arms, forearms, hands, legs, feet and to a lesser extent on the thighs and abdomen. It was very red. The edema had completely disappeared. December 5: Total protein was 9.3 mg. Albumin 3.7 mg. Globulin 5.6 mg. She continued to improve and gained considerable strength. On December 12, the rash had completely disappeared from her body. She had a little on her cheeks which was dry and scaly. Total protein 9 mg. Albumin 5.6 mg. Globulin 3.4 mg. She returned to her home.

On January 4, 1947, patient wrote that she had no rash except a little on the neck and face. She, also, reported that she had no swelling, but that she had had severe asthma the preceding night. She had to sit up most of the night, but had not taken epinephrine. Until this time cough and nasal symptoms had been very much improved.

January 8, 1947, patient wrote that she was having fever, the feet and legs were breaking out, she ached all over, had chilly sensations and felt very weak. She asked, "Is it possible that a blanket, with a small amount of wool, on the bed could be causing this?" I had previously advised her to avoid wool. In reply I again advised her to avoid wool.

January 16, 1947. Temperature: 98° F. Blood pressure 168/80. Weight 120 pounds. Spleen palpable. Ankles slightly edematous. Skin of face red. Eczematoid patches on legs. Skin was

otherwise clear. Urine: Albumin 2 plus, a few hyaline casts. Red cell count 3,620,000. Hemoglobin 9.6 Gm. White cell count 13,500. Polys 60%. Small lymphocytes 31%. Eosinophiles 9%. Total protein 9.6 mg. Albumin 4 mg. Globulin 5.6 mg.

January 23 she wrote that she was having fever, less than 100°, coming on about 3 P.M. She stated, "I am gaining strength fast."

February 1 she wrote that she had sores on her legs which were very painful. The preceding night she had urticaria on left hip.

February 10 she had quite a bit of rash on scalp and legs, and in places there were rather large scab formations. The underlying area was ulcerated. She had lost most of her hair. Temperature 98° F. Blood pressure, 150/80. Weight 124 pounds. Urine: Specific gravity 1.022. Albumin 3 plus. Otherwise negative. The blood count was very similar to previous one. Total protein 9.8 mg. Albumin 4.5 mg. Globulin 5.3 mg. She had no edema. She was advised to use hydrogen peroxide and boric acid for removing scales, and after removal of scabs to apply Tyroderm.

On February 15, she wrote that her hands and arms were breaking out, "with a red, red rash, that itches something terrible."

On March 12 she wrote that she had gained 12 pounds, did not have any swelling and that her skin was clear except for some dark spots on her legs.

On April 7 she wrote that she was having rheumatism or arthritis. She stated that it had started about five weeks previously in the fingers. They became very blue and numb. The blueness and numbness would come and go, but was getting worse. The fingers were painful and the pain radiated to the shoulders. She stated that she was having pains in both knees, pain in the muscles or nerves, and she emphasized that the pain was severe. She stated that her skin was about well except she had scars on arms and legs, however, she stated that they still itched. She, also, stated that she was "still breaking out with those large whelps."

April 15 patient came to the office. The wrists, knees, shoulder joints, and right ankle were very swollen and tender. She also had swelling of the proximal interphalangeal joints and the metacarpophalangeal joints. The swelling was typical of rheumatoid arthritis. The fingers were very blue. The scalp was covered with a new growth of hair. The skin on the outer surfaces of the legs had many areas of hyperpigmentation. It was in splotches of various sizes, of a brownish color, and at first glance, had the appearance of bronzing, but on closer examination appeared too dull. The skin between the areas of hyperpigmentation had a glazed, atrophic appearance. The spleen was palpable.

Temperature 98° F. Blood pressure 170/90. Weight 125 pounds. There was no edema except at the joints. Urine: Specific gravity 1.020. Albumin 3 plus. Occasional pus cell, otherwise negative. Blood: Red count 4,580,000. Hemoglobin 10.4 Gm. White count 9,400. Polys 80%. Small lymphocytes 13%. Eosinophiles 7%. Blood calcium 9.3 mg./100 cc. Phosphorus 5 mg. Total protein 7 mg. Albumin 2 mg. Globulin 5 mg. NPN 40 mg. She was given Amigen intravenously and seemed to improve. Most of the swelling left the joints, and they became less painful. X-ray examination of the skull and wrist joints was done April 22, 1947. The report of Dr. C. P. Rutledge, radiologist, was: "X-ray examination of the skull shows no evidence of fracture or other gross bone changes. The sella is of the semi-closed type and above the average in size. The clinoid processes show evidence of fragmentation suggestive of intrasella pressure. Wrist: Some demineralization is noted in both wrist joints, with narrowing of the joint spaces, which is more or less characteristic of an atrophic arthritis." No further studies were done relative to the fragmentation of the clinoid processes.

On May 7 biopsy was taken over and from the right deltoid muscle. The report of Dr. W. R. Mathews, pathologist, was:

"Gross: There are three masses of tissue. One is a fusiform excision of skin and subcutaneous tissue that measures as much as 1.4 cm. in width, 2 cm. in length, and 2 cm. in thickness. The skin is free from tumor, shows so far as I can tell normal color and is somewhat atrophic in appearance. The other two masses appear to be from muscle and measure 1 x 1 x 1½ and 1 x 1½ cm.

Microscopic: Dermatomyositis

1. Sections from the skin show atrophy and hyperkeratinization of the epidermis, proliferation, fibrinoid degeneration and perhaps slight edema of the collagenous tissue of the corium, thickening of the walls of the small vessels and perivascular infiltration with lymphocytes, plasma cells and monocytes. Also, one notes similar changes in the collagen and small vessels of the subcutaneous fat.

2. The muscle fibers are swollen and hyalinized, show no cross striation and there is proliferation of the sarcolemmal sheaths. The interstitial tissue is infiltrated with lymphocytes, plasma cells, and monocytes, especially around vessels and there is moderate fibroblastic reaction but no dense fibrosis as yet. The walls of the small arteries are thickened and in some instances show intimal hyalinization."

Patient returned to her home on May 13. She seemed to improve until July 1 when she developed a severe cold. On July 2 she had massive consolidation at the base of the right lung and some consolidation at the base of the left lung.

She expired on July 12, 1947, as a result of pneumonia.

DISCUSSION

Dermatomyositis is a disease of unknown etiology, but it has been suggested that an allergic mechanism may be the underlying cause. A typical case has been presented showing most of the various manifestations, and it occurred in a patient who had allergic symptoms all of her life and continued to have symptoms throughout the course of this disease. Dermatomyositis has a mortality rate of about 50 per cent and death is usually due to an intercurrent infection. Pneumonia was the cause of death in the case presented.

The case presented by McCombs and MacMahon² was suspected of having a drug rash. Other cases have been suspected of being contact dermatitis. In the case presented it was first thought that a drug was responsible for the rash. Later it was thought that wool might be the cause.

Diagnosis probably could have been established sooner had the true nature of the disease been thought of. However, biopsy does not always insure a positive diagnosis. Healthy muscle may be contiguous with diseased muscle, and if healthy muscle is obtained at biopsy the diagnosis would be extremely difficult.

The development of nephritis, rheumatoid arthritis, and Raynaud's phenomena during the course of the illness indicates that the systemic reaction is severe. The vascular lesions of this disease are a prominent feature, and if allergy is responsible for these changes, present methods of diagnosis are inadequate. Research work dealing with tissue reactions in the human subject as well as cultured tissues is strongly indicated.

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DISCUSSION

Dr. J. D. Youman, Jr. (Shreveport): Dr. Browning is to be congratulated on his presentation of this case of dermatomyositis, associated with respiratory allergy.

Dermatomyositis is an acute, subacute, or chronic disease of unknown origin, characterized by a gradual onset with vague and indefinite prodromes, followed by edema, dermatitis and multiple muscle inflammation.

The dermatitis may resemble erythema, erysipelas, urticaria, eczema, or erythema nodosum, as well as disseminated lupus erythematosus and early scleroderma. The face, especially the eyelids and the extremities, particularly the proximal portions and over involved joints are involved. Fever is moderate and remittent or intermittent. Enlargement of the spleen is frequently seen. Creatinuria is present, due to structural damage in the muscles.

Treatment is symptomatic. Some of the patients undergo spontaneous cure and others progress, as did Dr. Browning's, to final death from intercurrent infection.

The etiology of dermatomyositis is unknown and Dr. Browning suggests that an allergic mechanism may be the underlying cause. If by that, he means allergy to infection, as we feel rheumatic fever is, then I will agree with him. Several case reports that I have seen, tend to favor this idea, or that of an actual infection, itself. Omens, in 1944, reports the disease in a boy thirteen years old, who, because of progressive weakness, was even unable to raise his head from the bed. Sulfonamides caused no appreciable results. Penicillin was administered totalling 1,200,000 units; 200,000 units the first day by vein and thereafter 5,000 units every four hours by intramuscular injection, a very inadequate dosage, as we know today. Fifteen months later, when this case was reported by Omens the boy was able to get about with the aid of support. The exanthem had faded somewhat, but the edema was still present.

Madden, in 1944, reports an early case manifesting extreme laryngeal and pharyngeal edema, dermatomyositis of the extremities, and dermatitis of the face. He was given penicillin, 100,000 units daily. An improvement in his voice and

physical status was seen at the end of the third day. There was a decrease in the laryngeal edema. At the end of ten days, the cutaneous changes were almost gone. At the end of three weeks, there was no edema and the changes in the eyelids had entirely disappeared. He commented on this case, "This boy has had remarkable results with penicillin. The symptoms reappear in about forty-eight hours when penicillin is stopped." This sounds like what occurs in subacute bacterial endocarditis. The penicillin just does not have the power to completely eradicate the infection.

Andrews also reports a case in which penicillin was of help.

Benson Cannon, in 1944, reported a case with remarkable improvement after large doses of vitamin C, vitamin E; thyroid therapy, cod liver oil, and x-ray therapy.

Maurice Costello believes that dihydrotachysterol is of great value in these cases.

Both of these cases present the endocrine angle, which some believe to be the cause.

Dostrovsky and Sogher reported two cases, both of whom had malignant tumors. They concluded that there is a relationship between dermatomyositis and malignant tumors. The appearance of the dermatomuscular symptoms shortly after the development of the tumor, and moreover, their intensification on metastasizing of the tumor, thereafter persisting until the patients succumbed in a state of carcinomatous prostration, would uphold their views.

Herbert Rattner reported a case associated with carcinoma. In Dr. Browning's case, x-ray of the skull showed an unexplained fragmentation of the clinoid process, suggestive of intrasella pressure.

The total white counts in these cases is usually within normal limits, as was so with Dr. Browning's case. They do not, however, show an eosinophilia, as is present in the case presented. I believe this was due to the associated respiratory allergy and not related to the dermatomyositis.

We find ourselves again back where we started. We do not know the cause of dermatomyositis, but it is through such reports as Dr. Browning's, suggesting allergy, others suggesting an endocrine basis, those suggesting infection, and those suggesting malignancy that finally the answer will be unraveled.

SYMPATHETIC OPHTHALMIA

REPORT OF A CASE

WILLIAM W. HART, B. S., M. D.
SHREVEPORT

Case presented is one of sympathetic ophthalmia which developed as a complication of a perforating wound of the right eye.

REPORT OF CASE

A 48 year old negro female was admitted

to the Charity Hospital in New Orleans, Louisiana, on August 2, 1946, complaining of pain in both eyes and impairment of vision in both eyes. She gave a history of receiving a perforating wound in the right eye on June 3, 1946, when a bottle of beer exploded and a piece of glass hit her right eye and perforated the cornea.

She was treated by her local physician who closed the perforating wound of the right eye with corneal sutures and a conjunctival flap. The wound healed, but the right eye continued to pain and remained injected and sensitive to light with marked lacrimation all the time. On July 30, 1946 she developed redness and pain in the left eye and noticed some impairment of vision in left eye.

On admission to the Charity Hospital temperature was 98.6° F., respiration was 16, blood pressure was 110/60. General physical examination was negative.

Examination of right eye: Vision right eye, light perception. There was moderate injection, both deep and superficial of the conjunctiva. There was a healed laceration of the cornea extending from the limbus across the cornea from 9 o'clock to 3 o'clock. There was an incarceration of the iris in the corneal laceration. Lens capsule was ruptured and the lens was opaque.

Slit lamp examination right eye: Numerous keratic precipitates, definite aqueous flare with cells in the anterior chamber.

Fundusoscopic examination right eye: Unable to see fundus due to lens opacity.

Examination left eye: Vision 20/80. There was moderate edema of lids and conjunctiva. Moderate injection of the palpebral and bulbar conjunctiva. Cornea was clear. Pupil was irregular with many posterior synechia. Media was clear grossly.

Slit lamp examination left eye: Aqueous flare. Posterior synechia present with some uveal pigment deposit on anterior lens capsule.

Fundusoscopic examination left eye: Vitreous slightly cloudy. Disc margins were indistinct with definite elevation. Mild AV notching. There was definite stippling in

the macular area with some disarrangement of pigment.

Tentative diagnosis: Sympathetic ophthalmia OS.

Laboratory Report: RBC 4,500,000; Hemoglobin 14 grams; WBC 5,240; Differential: 58% Polymorphonuclears, 40% Lymphocytes, 2% Monocytes. Blood Wasserman negative; Urinalysis negative; Blood Chemistry: urea 14 mg.; glucose 114 mg.; X-ray of chest negative; EKG negative; X-ray of sinuses negative. Dental check up was made and dentist recommended extraction of all teeth, which was performed.

Treatment: Treatment consisted of: Atropine 1% gtt. 1 OU t.i.d., Penicillin, units 25,000 q 3 hours for 5 days. Patient was given 100 grains of sodium salicylate and calcium gluconate 7½ grains daily. She was also given 5 milligrams of Vitamin B₁ t.i.d.

On August 4, 1946 enucleation of OD was performed under local retrobulbar anesthesia.

Patient was started on intravenous typhoid, first dose, 30,000,000 killed typhoid bacilli given intravenously and was increased 15,000,000 every other day for eight doses. There was a moderate response to this with temperature rising to 101° F. after each injection. It was then deemed advisable to give this patient artificial fever therapy. Artificial fever therapy was started September 3, 1946 and she received ten treatments. Temperature range on the fever therapy was 103 to 105° F. for two to three hours each time. The interval between treatments was five days.

Pathological Report—Gross: The specimen consists of a firm eye measuring 25 x 24.5 x 24.5 mm. An opaque band scar extends across the cornea from 2 to 9 o'clock. There are folds of the retina and thickening of the choroid posteriorly. Engorged blood vessels radiate from the nerve head. The macula is swollen. There are adhesions to the posterior surface of the cornea.

Microscopic: The iris and perforated lens are adherent to the scar of a perforating wound of the central cornea which in-

cludes pigment granules. There is anterior synechia and the anterior chamber contains serous exudate and pigment-bearing wandering cells as well as chronic inflammatory cells which also infiltrate the iris. There is massive infiltration of the ciliary body and choroid by lymphocytes with patches of epithelioid cells resulting in thickening of the ciliary body and the choroid at the disc. There are occasional giant cells but there is no destruction of tissue; epithelioid cells contain pigment granules. In at least one area of the choroid the pigment epithelium is disturbed with the formation of a Dalen-Fuchs' nodule. The retina is uninvolved except for lymphocytic periphlebitis and an occasional focus of epithelial cells. A few chronic inflammatory cells cling to the inner retinal surface in clumps and are present in a plastic cyclitic membrane. There is serous retinal detachment. The disc is slightly edematous and the lamina cribosa is depressed.

Diagnoses: Perforating wound, cornea and lens; traumatic cataract; retinal detachment; sympathetic uveitis.

Progress: Left eye remained active until November 20, 1946. Patient was discharged from the hospital November 27, 1946. Vision in left eye 20/120. She was discharged on Atropine 1% daily and was followed in the Eye Clinic at intervals from four weeks to three months. On her last examination October 27, 1947, vision OS 20/120, and left eye appeared quiet at that time.

DISCUSSION

Sympathetic ophthalmitis is a specific bilateral inflammation of the entire uveal tract of unknown etiology characterized clinically by an insidious onset, a progressive course with exacerbations and usually a disastrous termination; and pathologically by a nodular or diffuse infiltration of the uveal tract with lymphocytes and epithelioid cells which almost invariably follow a perforating wound involving uveal tissue.

The disease appears in the injured eye or exciting eye at a variable time after injury and affects the other eye at the same time or shortly afterwards, but the clinical and pathological picture presented by the

two eyes is identical. The general incidence of sympathetic ophthalmitis is difficult to assess since the cases from the single observers are few and pathological proof of the condition is usually lacking so that the diagnosis in many reported cases remain presumptive. It is, however, a relatively rare disease and owing to the improvements in the surgical technic of the treatment of wounds is undoubtedly becoming rarer.

Quite a number of conditions may be responsible for sympathetic ophthalmitis. In general terms, it may be said that of these the most common are perforating wounds which account for some 65 per cent of these case in literature; operative wounds are responsible for another 25 per cent, while the remaining 10 per cent are made up of cases which follow non-perforating contusions with sub-conjunctival scleral rupture, perforating corneal ulcers, and intra-ocular tumors. It is the rarest thing for sympathetic inflammation to arise without rupture of the globe.

It is a very old observation that suppuration in the injured eye is rarely followed by sympathetic disease, so old indeed that pre-Listerian surgeons intentionally produced the beneficent suppuration in a badly injured eye believing that the purulent inflammation destroyed the factors responsible for the condition or prevented infection passing up the optic nerve by sealing the lymph spaces.

The statistical incidence of sympathetic ophthalmitis after perforating wounds of the globe is of interest. Its assessment is somewhat difficult owing to lack of adequate proof of the condition in many in-

stances. An average might be taken from literature at about 2 per cent.

The interval between injury and the onset of the inflammation is also of importance. This varies from nine days to twenty years. In general terms, however, it may be said that cases occur exceptionally before an interval of two weeks; that 65 per cent occur before an interval of two months; 80 per cent before an interval of three months and 90 per cent before the lapse of a year. The most dangerous time is from the fourth to the eighth week. We may assume that the chances of development of sympathetic ophthalmitis after three months are few, but that the possibility of its occurring exists indefinitely.

In treating these conditions prophylaxis should be the first concern with adequate toilet of perforating wounds. The most common precursors of sympathetic disease are delayed healing owing to entanglement of the iris, ciliary body, or lens capsule in the wound and the retention of a foreign body. Every endeavor should therefore be made to eliminate these at the earliest possible moment as upon the success of these results, the ultimate fate may depend. If, despite these precautions the eye continues to remain irritable, with photophobia, lacrimation and ciliary injection, more drastic steps should be contemplated. It is now generally recognized and universally acted upon that the most valuable and important method to prevent the onset of sympathetic disease is the enucleation of the injured eye before the characteristic pathological changes have become established.

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POSSIBLE EFFECTS OF CHEMICALS USED IN PERMANENT WAVE PROCESS

It is estimated that some permanent wave process will be used fifty million times this year and that in the past three years thirty million or more cold waves have been given. Recently the process and materials for "cold wave permanent" have been made available for use in the home, with the result that many persons will deal intimately with chemicals about which they know little.

The incidence of injurious effects from the "cold wave" process has been stated to

be under 0.1 per cent. Goldman, Mason and McDaniel divide these effects into changes in the hair, skin irritations and body poisoning. The change in the hair include drying, splitting, changes in tensile strength elasticity; there may be darkening of the hair and it is stated that the hair is not in a normal state after the process.

In the "cold wave" process the hair is treated with an alkaline reducing agent, usually ammonium thioglycolate. Systemic poisoning from salts of thioglycolic acid has been studied experimentally. It was found that ammonium thioglycolate may be absorbed percutaneously and that minor fluctuations occur in the hemoglobin content of the blood and in the volume of erythrocytes of animals. However, the dose level is higher and the manner of contact different from which would prevail under conditions prescribed for use. Accordingly it was felt that the risk of systemic effects was remote if directions were followed.

The skin irritations are a source of concern and are more likely to be observed in the operator than in the patron. It is stated that none occurs in concentrations below 8 per cent by volume of ammonium thioglycolate. The effect on the skin appears when the solution is applied in undiluted form over a prolonged period of time. It is one of direct irritation and not sensitization.

The "cold wave process" involves the use of many substances. In the event of any irritation presumed to have followed the use of this process, the skin must be tested with the six or more solutions employed in the various steps. The skin lesions are described as pruritic, discrete papulopustular and vesicular about the scalp, ears and shoulder, or an eczematous contact dermatitis of the hair line and occasionally of the scalp.

A carefully devised procedure is recommended for purposes of prophylaxis. Among others, it is suggested that no large quantities of the cold waving materials be allowed to remain on the surface of the skin, and that as far as possible none should be permitted to remain longer than is re-

quired to remove it from such skin surfaces as those of the neck and forehead.

THE PARISH MEDICAL SOCIETY

The functioning unit of organized medicine is the county, or parish medical society. It is here that medicine first began to grow. The parish society is the place where the individual physician must be informed and kept united to the whole. By knowing his associates and their problems, a sense of solidarity is maintained. Where this exists a medical organization can speak with authority and effectiveness. At present more than at any time past such a forceful voice is needed.

However, many factors have contrived to weaken that voice. Prominent among these are specialization, specialty societies and hospital staff meetings. The physician's day does not stretch any more than that of

his patients. As a result there may be more meetings than there are evenings to put them in. The hospital has a special call on the doctor's time; he is pushed by the rating authorities and pulled by an attractive program to attend hospital staff sessions. To secure a satisfactory attendance the program is frequently one of scientific essays and not hospital business. In this manner the hospital staff usurps the function of the parish society in many cities.

The meetings of hospital staffs and specialty groups have their function but the parish society represents and acts for all. It is here that medicine's public relations must be properly considered; it is here that plans for such things as publicity, medical emergencies, night calls, blood banks, epidemics and health programs should be discussed and understood. These matters are the concern of the membership and of the parish or county societies.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

MEETING OF HOUSE OF DELEGATES AMERICAN MEDICAL ASSOCIATION Chicago, June 21-25, 1948

Dr. M. D. Hargrove, President and Members of Executive Committee, Louisiana State Medical Society, New Orleans.

Gentlemen:

The House of Delegates of the AMA was called to order on Monday, June 21, 1948, at 10:00 a. m. with both delegates from the Louisiana State Medical Society present. Dr. Graves was made a member of the reference committee on amendments to the Constitution and By-Laws. Out of 175 delegates 160 were present at the initial meeting.

The recipient of the distinguished service award was Dr. Isaac Arthur Abt, of Chicago.

The first session was taken up with the president's report and the introduction of the president-elect, followed by reports of the Board of Trustees and the Council. Dr. Ernest Howard, the new assistant secretary of the AMA, was presented to the group. Surgeon General Swanson, USN, gave a very interesting talk and Dr. Scott Stevenson brought greetings from the British Medical Society. This was followed by greetings from Dr. H. B. Washburn, president of the American Dental Association.

As usual there was much work to be accomplished in the House and our only off day (Wednesday) had to be filled with both morning and afternoon sessions. A tremendous amount of work was accomplished and of particular interest was the adoption of a new Constitution and By-Laws. This will be published shortly and we believe it

would be worthwhile for each member of our Society to receive a copy.

In addition a new "Principles of Medical Ethics" was presented. All in all we believe it is an excellent guide to correct conduct but there is one part to which we believe objection should be advanced and one morning was spent in a committee meetings giving reasons why this should be done. As soon as these are published not only every member of our Society but also every medical student graduating from our two universities in Louisiana should be given a copy.

A committee of five to study the nursing problem in the United States gave a very comprehensive report. It was interesting to see that from a questionnaire sent by the AHA in 1947 to 3800 member hospitals, of 2376 replies received, 37 per cent stated they needed no more nurses. This committee proposed training of nurses in the future under two grades: a. professional nurses; b. trained practical nurses. The professional nurses to be divided into: a. nurse educators; b. clinical nurses. For trained practical nurses was recommended one year of training made up of three months theoretical and nine months practical training. This could be completed in a hospital or three months theoretical training taken under the Department of Education and nine months training in an acceptable hospital. Provisions are made to allow credits in select cases toward training for advancement from a group of trained practical nurses to the group of professional nurses.

The committee to study the Red Cross blood bank situation spent the entire morning in hearings and wound up with a very comprehensive report. It was the opinion of this committee that the "approved in principle" be construed as follows: 1. Local control must be by the county medical society. 2. The local medical society should be the initial contact contemplating inauguration of a new blood bank. 3. No publicity or news shall be released except by mutual consent of the local county medical society and the local chapter of the American Red Cross. 4. Difference of opinion in establish-

ment or operation of a blood bank in either administrative or technical details shall be arbitrated at state level by joint committees of the state medical society and the American Red Cross. This committee also feels that any provision for free medical service or supplying to everyone, without regard to ability to pay, is in opposition to the principle that it is the responsibility of an individual to assume the obligation of medical expenses just as he does for other living expenses. It deplores the use of the term "free blood" in publicity of the American Red Cross.

A resolution was adopted opposing the plan of the American Academy of Pediatrics to seek federal support.

In the report of the Secretary the State of Louisiana was mentioned as having 42 component societies in 64 parishes of the state with 15 parishes not being organized. Of the 2601 doctors registered in Louisiana 1722 are members of the State Society and 876 are fellows of the AMA.

A motion was adopted that under the VA plans the veteran should be able to be treated in his own community and in a hospital and by a doctor of his own choice.

The Committee on Medical Education and Hospitals was increased from five to seven members with the provision that one of these members should be a practicing physician, not a member of a teaching staff of a medical school and not associated with a medical school hospital staff.

The AMA and the American Cancer Society were requested to adopt standards for cancer detection and diagnostic clinics.

A resolution was also adopted urging the state medical societies to make wives of their members automatically members of the auxiliary and that these state societies find some way to finance the dues of the national auxiliary organization.

The following officers were elected after Dr. Sensenich was installed as president:

President-elect—Dr. Ernest E. Irons, Chicago

Vice-President—Dr. R. W. Fouts, Omaha
Secretary—Dr. George F. Lull, Chicago
Treasurer—Dr. J. J. Moore, Chicago

Speaker of House of Delegates—Dr. F. F. Borzell, Philadelphia

Vice-Speaker of House of Delegates—Dr. James Reuling, Bayside, New York.

The new members of the Board of Trustees elected were: Dr. Ed. Hamilton, of Illinois, to succeed Dr. Irons; Dr. Gunnor Gunderson, of Wisconsin, to succeed Dr. Braasch; Dr. Walter B. Martin, of Virginia, to fill the unexpired term of Dr. C. W. Roberts, deceased.

It is the suggestion of your delegates that when the complete reports, particularly those of the Committee on National Emergency Medical Service, and the Committee on Rural Medical Service, appear in the Journal of the AMA that it will be time well spent to read these in their entirety.

Respectfully submitted,

VAL H. FUCHS, M. D.

J. Q. GRAVES, M. D.

Delegates to AMA.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

ALVARENGA PRIZE

In recognition of his studies on "Sludged Blood" the College of Physicians of Philadelphia awarded on July 14, 1948, the Alvarenga Prize for this year to Melvin H. Knisely, M. D., of the University of Chicago.

The Alvarenga Prize was established by the will of Pedro Francisco da Costa Alvarenga of Lisbon, Portugal, an Associate Fellow of the College of Physicians of Philadelphia, "to be awarded annually by the College of Physicians on each anniversary of the death of the testator, July 14, 1883."

The College usually makes this award for outstanding work and invites the recipient to deliver an Alvarenga Lecture before the College.

AMERICAN COLLEGE OF PHYSICIANS

The American College of Physicians will conduct its 30th Annual Session at New York, N. Y., March 8 through April 1, 1949. Dr. Franklin M. Hanger, Jr., of New York City is the Chairman for local arrangements and the program of clinics and panel discussions. The president of the College, Dr. Walter W. Palmer, Director of The Public Health Research Institute of the City of New York, Inc., and Professor Emeritus, Columbia University College of Physicians and Surgeons, is in charge of the program of morning lectures and afternoon general sessions.

RESEARCH FELLOWSHIPS

The American College of Physicians announces that a limited number of Fellowships in Medicine will be available from July 1, 1949-June 30, 1950. These fellowships are designed to provide an opportunity for research training either in the basic medical sciences or in the application of these sciences to clinical investigation. They are for the benefit of physicians who are in the early stages of their preparation for a teaching and investigative career in Internal Medicine. Assurance must be provided that the applicant will be acceptable in the laboratory or clinic of his choice and that he will be provided with the facilities necessary for the proper pursuit of his work. The stipend will be from \$2,200 to \$3,200.

Application forms will be supplied on request to The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pa., and must be submitted in duplicate not later than November 1, 1948. Announcement of the awards will be made as promptly as is possible.

PHYSICIAN WANTED

Due to the recent death of Dr. R. K. Comeaux, of Youngsville, there is need for a physician in that community. Due to the volume of practice a young, active physician would be most suitable and a knowledge of the French language would be quite

advantageous. Office space and equipment is available. For further information contact Mrs. R. K. Comeaux, Youngsville.

DR. GILBERT CHRISTIAN ANDERSON

The medical profession lost one of its most widely esteemed and useful members in the death of Dr. Gilbert Christian Anderson, past president of the Louisiana State Medical Society and a pioneer in the practice of neurosurgery, who passed away on June 27, 1948. Dr. Anderson was a graduate of Columbia University, later seeing service in World War I.

Upon the completion of his specialized training in neurosurgery at the Mayo Clinic he came to New Orleans in 1927 as the first practicing neurosurgeon in this area. The abundant enthusiasm and tireless energy which he carried to his classes as professor of neurosurgery at Tulane University Medical School, and later at L. S. U. Medical School, inspired and encouraged others to enter the field of neurosurgery.

Dr. Anderson was above all else a devoted physician, and he was every ready to help the poor as well as the more fortunate. He gave his time to the out-patient clinic at Touro Infirmary for 18 years, and later he was available when his special talents and knowledge were needed.

At De Paul Sanitarium, where he was consultant in neurosurgery for a number of years, there were many problems resolved by his unusual diagnostic talents.

WHEREAS the entire Staff and personnel of the De Paul Sanitarium are conscious of a tremendous loss in the passing of this greatly admired member of our group:

AND WHEREAS we wish to join with the Sisters of Charity of De Paul Sanitarium in praying that God will reward Dr. Anderson with eternal peace and happiness for his great and noble service to his fellowmen,

BE IT RESOLVED in recognition and appreciation of his able, unselfish and devoted service to the mentally ill, the entire Staff and personnel of De Paul Sanitarium express their consciousness of a tremendous loss in the passing of this greatly admired member of our group.

BE IT FURTHER RESOLVED that a copy of these resolutions be sent to the family of Dr. Anderson, a copy be published in the New Orleans Medical and Surgical Journal, and a copy spread on the minutes of the De Paul Staff.

HENRY O. COLOMB, M. D.

EDMUND CONNELLY, M. D.

CHARLES S. HOLBROOK, M. D.

WOMAN'S AUXILIARY

A new Council has been formed in the State Auxiliary with Mrs. D. B. Barber as Chairman and a representative from each district. It is to

be known as the *Auxiliary Council on Medical Service and Public Relations*. The purpose is to serve in conjunction with the Louisiana State Medical Society's Council on Medical Service and Public Relations and to act as a news gathering agency for our own publication, "*Auxiliary News and Views*", appropriately named, sponsored and mailed by the Society Council.

It was this new Council's privilege to meet in New Orleans July 10, 1948 with the Louisiana State Medical Society's Council on Medical Service and Public Relations. Dr. A. V. Friedrichs, Chairman, presided and outlined their program so far and the activities planned for the ensuing year.

Dr. Friedrichs says in the booklet on Public Relations Program, "The purpose of this program shall be to further a better understanding of problems both to the laity and the profession, to disseminate information which is of general intent and value through all available media, and to keep both the public and the medical profession informed of significant progress in all fields of medicine." This booklet and one entitled, "Services of Your Medical Society" have been sent to all Louisiana doctors as well as to other state societies. A one page *News letter* is mailed monthly to every doctor. Ask your husband to bring them home and share them with you!

The Society Council has attended and actively participated in many meetings including, The Louisiana Rural Health Council, the Steering Committee of the Health, Physical and Safety Education Council of the Department of Education, Health Workshops at Southwestern Louisiana Institute, Lafayette and Northwestern State College, Natchitoches, local, state and national medical meetings and also the National Health Assembly in Washington, D. C.

Splendid cooperation has been given by nine radio stations throughout the state with a total of 168 broadcasts already presented at no cost to the doctors.

Society and Auxiliary members are urged to continue in getting information of these broadcasts before the public by placing posters in your office, drug stores and other places. Doctors are requested to enclose information supplied them in their monthly bills. As part of the new program newspapers are prepared to publish weekly a health column on timely articles supplied them by this Council.

A *Speakers Bureau* has been set up and each Society should select five doctors in each community and send their names into the state Bureau along with a list of clubs and organizations. These lay organizations ordinarily using speakers will be notified that talks on medical subjects and speakers will be available through this Bureau. Speakers' kits will be supplied the doctors. A *News Bureau* has been set up on all matters of public interest and Auxiliary members are requested to send in

any information on problems or plans of a local interest to Mr. Frank Lais, Executive Secretary, 1430 Tulane Ave., New Orleans. Mr. Lais reported on the progress of the Voluntary Prepayment Surgical Care Plan.

Most significant of all the public relation endeavors is the new School Program. The Council on Medical Services and Public Relations proposes to assist in the establishment of HEALTH COUNCILS throughout the State of Louisiana. It has already participated in the organization of a STATE HEALTH COUNCIL. Plans are now underway in its participating in the establishment

of parish health councils and possibly the establishment on individual community health councils. A doctor should be at the head of each Health Council and it is their aim to see that every school child receives a physical examination before he or she enters school. This State Health Council is working with the Farm Bureau and the State Department of Education and others. Much work is yet to be done. Let us all do our share, starting now. Get in touch with your State President, Mrs. O. B. Owens for further information.

MRS. F. U. DARBY,
Press & Publicity Chairman.

BOOK REVIEWS

Coronary Heart Disease: By A. Carlton Ernestene, M. D. Springfield, Charles C. Thomas, 1948. Pp. 95. Price, \$2.50.

This small book of eighty-six pages is divided into eight chapters with five pages of references.

In presenting the different manifestations of coronary disease the views expressed may be said to represent the present status of our knowledge of this disease.

In the introductory chapter the author calls attention to the fact that in many cases of coronary disease the diagnosis will depend entirely on the patient's history. This is not new but will bear repeating. The fundamental pathological changes usually found in coronary disease, the influence of hypertension and diabetes is discussed briefly but sufficient for a book of this size.

In discussing the differential diagnosis of angina pectoris the author states that, "The pain in hiatus hernia, esophogospasm or cardiospasm is not brought on by physical exertion but may be induced by excitement or large meals and is usually of longer duration than is angina pectoris and it is not relieved by rest but nitroglycerine may be effective." The opinion of the reviewer is that this is true as a rule and should be of help in the differential diagnosis. There are, however, cases of angina pectoris where the attacks seem to be precipitated more by emotional stress than by physical exertion.

It is stated that in myocardial infarction that the electrocardiogram will show diagnostic changes in practically every case if the records are made every few days and precordial leads are used in addition to the standard leads. It should be remembered that a sufficient number of chest leads should be made. Most of the important findings in the differential diagnosis of myocardial infarction are mentioned, but some of importance are not. To mention one; the diastolic murmur heard in the aortic area in cases of dissecting aneurysm of the aorta.

Three pages are devoted to "acute coronary fail-

ure". This may be a convenient name for cases of cardiac pain that last twenty minutes or longer not followed by evidence of infarction. However, the line of demarcation between these cases, angina pectoris and myocardial infarction is not clear clinically.

In speaking of the recent emphasis given to certain harmful effects that may follow the sudden enforcement of recumbency in patients who have congestive failure, the author has this to say, "These effects are to be regarded as complications against which suitable precautions should be taken and the possibility of their occurrence does not detract from the importance of rest in heart failure." This is true and to the point. The reviewer feels that possibly the recent emphasis given to the complications that arise in bed patients has been misunderstood by some.

Some of the newer remedies such as plasma and dicumarol are discussed.

There may be slight differences of opinion in some of the views expressed in this book but there are few. The book is well written, the print is good. The book should be of value to anyone interested in the subject. The reviewer recommends it.

J. M. BAMBER, M. D.

The Acute Bacterial Diseases, Their Diagnosis and Treatment: By Harry Filmore Dowling, M. D., F. A. C. P. Philadelphia, Saunders, 1948. Pp. 465. Price, \$6.50.

This volume attempts to summarize modern concepts and methods used in the diagnosis as well as treatment of coccal and bacillary infections or the intoxications due to their respective exotoxins. Early sections review the basic features of the clinical characteristics and laboratory diagnosis of infectious diseases. These are followed by a chapter dealing with general measures employed in treatment such as administration of oxygen and fluids, control of food and diet, support of circulation, isolation procedures. Separate chapters next

discuss the use of antisera, sulfonamides, penicillin and streptomycin respectively, with stress on their administration, absorption, distribution, excretion and toxicity. Thereafter the clinical conditions caused by the various etiologic agents are presented. For each disease there is a concise statement of the pathogenesis, general signs and symptoms, special features of the infection and likely complications, methods for differential clinical diagnosis, laboratory examinations, methods for treatment and prevention.

There are numerous illustrative charts and summaries of typical case histories, tables of pertinent statistical data, well-reproduced photographs and drawings of characteristic lesions. An appendix outlines methods for the assay of sulfonamides, penicillin and streptomycin in body fluids. The authors and publishers deserve credit for their success in combining literary and graphic methods to present effectively a large amount of useful information.

The book is intended as a practical guide for physicians. In view of Dr. Dowling's stress on the importance of etiologic diagnosis, one criticism which may be fairly levelled is the sketchiness of the presentation concerning laboratory examinations throughout most of the book. The information on the collection and handling of specimens is often perfunctory and is rarely adequate to enable the physician to evaluate the performance of the laboratory doing his work or to suggest the most appropriate methods for a particular examination.

In the case of certain infections, however, the reader might obtain an erroneous notion of present-day concepts of the immunology or proper bacteriological practice. Since the book should have a wide sale it is to be hoped that the next edition will be revised to remedy the presently existing defects.

MORRIS E. SHAFFER, M. D.

Laboratory Diagnosis of Protozoan Diseases: By Charles Franklin Craig, M. D., M. A. (Hon.), D. Sc. (Hon.), F. A. C. S., F. A. C. P., Colonel, M. C., U. S. A. (Retired), 2d ed. Philadelphia, Lea and Febiger, 1948. Pp. 384. Price, \$6.50.

This is a thoroughly revised and enlarged sequel to the praise-worthy first edition which was published in 1942. There is evidence that the War years contributed not only considerable new information but added materially to practical methods for the laboratory diagnosis of the protozoan infections.

The volume is divided into six parts as follows: I, Amebiasis and Intestinal Flagellate Infections; II, The Leishmaniasis (Kala-Azar, Oriental Sore and Espundia); III, The Trypanosomiasis (African Trypanosomiasis and Chagas' Disease); IV, Coccidiosis; V, Malaria, and VI, Balantidiasis. In each infection the etiological agent is clearly de-

scribed and illustrated, the methods for obtaining diagnostic material are listed and the technics for carrying out useful diagnostic procedures are presented in detail. For the physician or medical technologist with a basic knowledge of the protozoa of man and of laboratory methods of diagnosis Colonel Craig's handbook constitutes a most valuable, authoritative aid.

The book has an attractive format, the print is clean and the illustrations, including line drawings, half tones and seven color plates, are pleasing in appearance and diagnostically valuable. The binding is neat and substantial. Both author and publisher are to be complimented on the new edition. The reviewer recommends this volume to all persons who have professional interest in protozoan diseases of man.

ERNEST CARROLL FAUST, PH. D.

Headache and Other Head Pain: By Harold G. Wolff. New York, Oxford University Press, 1948.

In this scholarly work Wolff discusses the various types of head pains. There is first a preliminary description of pain, in which the various factors; causes, threshold, references, etc. are ably discussed. Wolff incidentally was President of the Association for Research in Nervous and Mental Disease. With his coworkers in this association he has added greatly to our knowledge of the unpleasant sensations which we call pain. The group published a collection of reports in 1943 in a volume entitled "Pain".

He is a neuropsychiatrist, who has for many years been interested in various types of headaches, and much of our knowledge of the various headache syndromes has been derived from his work. There are many articles on this subject which he has contributed, either alone or with others. He has made intricate studies on the localization of various head pains, along with experimental studies on the associated pathological physiology involved. This book is of great value principally because this work is now organized and unified in one publication, and the assembled data are of great help to anyone interested in the problem of headache.

The views of the author however are basically those of a neurologist and psychiatrist. The reviewer does not accept for instance the stand that Dr. Wolff has taken on the question of allergic headaches. The author feels that psychogenic factors are of paramount importance in certain vascular pains, such as the entity spoken of as migraine. We all agree that migraine is but one variant in the larger group of vascular headaches. According to him the causes of these pains are due to mental states, rather than to somatic alterations.

He states that "no well controlled clinical study has yet been reported to support the contention

that migraine headache is an allergic reaction." Yet he goes on to show histamine has a very definite vasodilating effect on intra and extra-cranial vessels. We now realize that histamine production in the body is part of the allergic reaction.

In support of his view he cites Pfeiffer, Dreisbach, and Roby. The following is a verbatim quote from the footnote on pages 360-61.

"To illuminate further this matter of food 'allergy', the following experiment was performed. Four able physicians, experienced in experimental methods, and themselves migraine patients, were the subjects. These four physicians, who were of the opinion that they could predictably produce migraine headache in themselves by eating chocolate in any form and in minimal amounts, were each given a set of lettered, sealed envelopes, with the key to the contents held in the laboratory, and unknown to the subject. Each envelope contained either 8 Gm. powdered chocolate or 8 Gm. lactose, in 8 black capsules. The two sets of capsules were indistinguishable in appearance. Two subjects ingested the contents of an envelope at convenient intervals. One subject ingested the contents of an envelope at regular intervals, three times a week. The fourth subject who commonly awoke on Saturday mornings with a migraine headache attack after eating chocolate on Friday evening, ingested his capsules on Friday evenings for a period of four months. All were instructed to include no chocolate in their regular diet. Careful records were kept by each subject, including the following data: the letter on the envelope; the date and time of ingestion of the contents; the date and time of onset of all headaches experienced during the experimental period.

"It was found in these subjects that headaches sometimes followed the chocolate, sometimes the lactose, but most commonly attacks occurred without reference to the ingestion of capsules. Migraine headaches followed the ingestion of lactose just as frequently as they followed the ingestion of chocolate. The data thus accumulated indicate that in these individuals who considered themselves 'allergic' to chocolate even in minimal amounts, the occurrence of their headaches was no more related to the ingestion of chocolate than it was to the ingestion of lactose."

To the reviewer this does not prove that an allergic reaction is not capable of producing the various vascular dilatations which cause certain headaches. It is not conceivable that the wealth of evidence to support the allergic concept is erroneous, and that the headaches due to certain antigens are all explainable on another basis. Too many patients have stated that certain foodstuffs regularly produce headaches. The widespread skepticism concerning the phenomena of clinical allergy

The allergist recognizes clearly that psychosomatic is well illustrated here.

genic factors alone may precipitate these vascular changes. The headache patient has a substrate or tendency to vascular dilatation of the cranial vessels. This dilatation may be brought on by vasodilators such as the nitrites. In the allergic individual we see the endogenous production of a potent vasodilating substance. Also the allergic individual is as a rule unstable, in that he is affected by non-specific factors which may initiate the syndrome. Upsets in the bodily physiology, environment, mental state, etc. are often capable of setting the vasodilating mechanism into action.

Also at times the allergic individual will not be affected by the allergenic substance, if the optimum situation is not present. We know that true allergic asthmatics may tolerate the causative antigens under certain conditions. In some patients, there is also the quantitative factor to be considered. As an example a small amount of a certain foodstuff may be tolerated. A larger amount may precipitate symptoms.

The quantity of histamine required to produce symptoms is an important factor. We all recognize that too small an amount may not affect the vessels.

This is also true of other vasodilators. A physician subject to migraine, knows by experience that he can tolerate a small amount of an alcoholic beverage. Several drinks on the other hand, quickly produce an annoying headache.

In support of Dr. Wolff's viewpoint it must be stated that he and others have found that various therapeutic measures give varying degrees of relief to individuals with migraine. Their measures may be of a more or less non-specific nature. He discusses dietary methods in the management of migraine under the following heading: "Agents or Procedures That Act by Inducing Feelings of Security through Suggestion, Reassurance, and Confidence in the Well-Planned Regimen Imposed by the Sanitarium or Physician". It is obvious that these patients are helped by almost any vigorous, directed type of therapy. This however still does not prove that the allergic reaction is not capable of initiating an attack.

Dr. Wolff concedes that headache may result if the nasal mucosa is involved in the allergic reaction. He however does not emphasize the frequent occurrence of frontal pain which is often seen in conjunction with nasal allergy. In my experience this very frequently complicates hay fever or perennial rhinitis.

Psychiatrists have a tendency to explain the various allergic syndromes on a basis of conflicts. However, the formation of specific antibodies is a somatic process. I cannot accept the idea that a house dust asthmatic, who has transferable humoral antibodies to house dust, can be classified in any way except as a house dust allergic. Under control conditions, asthma may be precipitated by giving the patient a large amount of house dust

extract. It is granted that emotional upsets may initiate individual attacks, but the underlying sensitization or substrate is in the background. Mental conflicts may be demonstrated in patients with cancer, appendicitis, asthma, etc., but this does not prove the mental disturbance is the essential cause of the disorders. I have been informed by a sincere psychiatrist that the formation of specific antibodies themselves may have a psychogenic basis. Does anyone claim that the antibody formation associated with immunity is in any way connected with psychogenic factors? It has been stated that allergy is really an altered form of immunity. Therefore, this theory is not logical and cannot be accepted.

Exclusive of this difference of opinion, I found Dr. Wolff's book to be of great interest, and as stated above feel that it should be read by any physician interested in the problem of headache.

HENRY D. OGDEN, M. D.

Diseases Transmitted from Animals to Man: By Thomas G. Hull, Ph. D., 3rd ed. Springfield, Charles C. Thomas, 1947. Pp. 571. Price, \$10.50.

Commenting on the second edition of this work in 1941, the late Dr. Musser, wrote—"The book is filled with information which would be of service to the doctor of medicine, of veterinary medicine, and to public health officials, as well as, to lay persons who are interested in individual and public health problems. For the physician there is a tremendous amount of information condensed in a relatively few pages which would necessitate an extensive survey of the literature were he to attempt to obtain facts such as are contained in this excellent book. It is to be recommended most highly". The present edition lives up to this recommendation. All the chapters of the old edition have been rewritten and brought up to date and nine new chapters added. Of these latter, the one on yellow fever is the most complete and informative. Tuberculosis has been expanded from 34 pages to 56 and is very complete. Section 5, includes at the end, a list of the diseases transmitted to man by the horse, cow, dog, cat, etc. These lists are indeed formidable for each genus. There are 30 new illustrations.

While the work is primarily of interest to public health people, the physician will undoubtedly find it a mine of information, but with scant references to treatment. Except for one reference to *Amoeba histolytica* noted misprints are remarkably few. Such a book should be available to all those who have the overall supervision of the health of sections of the population in any part of the world.

A. J. WALKER, M. D.

The Pathology of Nutritional Disease: By Richard H. Follis, Jr. Springfield, Charles C. Thomas, 1948. Pp. 291. Price, \$6.75.

This book fills a real need in bringing together, under one cover, existing information on the pathology of nutritional disease in Mammalia. The author discusses both physiological and morphological changes which result from deficiency of each of the known essential nutrients including elements, amino acids, vitamins and fatty acids. A description of the pathology which occurs in man is included whenever facts are available. The paucity of information particularly in humans is astounding and should stimulate further research. No single nutrient has been studied simultaneously from a biochemical, morphological and physiological standpoint.

The book includes a number of excellent photographs illustrating morphological changes and a valuable bibliography of 791 references. It should be of great assistance to students of nutrition and related sciences.

GRACE A. GOLDSMITH, M. D.

PUBLICATIONS RECEIVED

Blakiston Company, Philadelphia: *Diagnosis in Gynaecology*, by James V. Ricci, A. B., M. D.

Grune & Stratton, New York: *Failures in Psychiatric Treatment*, edited by Paul H. Hock, M. D.; *Progress in Neurology and Psychiatry (Volume III)*, edited by E. A. Spiegel, M. D.; *Venous Thrombosis and Pulmonary Embolism*, by Harold Neuhoef, M. D.

C. V. Mosby Company, St. Louis: *Clinical Laboratory Methods and Diagnosis (Volumes I, II, and III, 4th edition)*, by R. B. H. Gradwohl, M. D., D. Sc., F. R. S. T. M. & H. (London); *Handbook of Ophthalmology*, by Everett L. Goar, A. B. M. D., F. A. C. S.; *Practice of Allergy*, (2nd edition), by Warren T. Vaughan, M. D., revised by J. Harvey Black, M. D.; *Principles Governing Eye Operating Room Procedures*, by Emma I. Clevenger, R. N.

Philosophical Library, New York: *Twentieth Century Speech and Voice Correction*, edited by Emil Froeschels, M. D.

W. B. Saunders Company, Philadelphia: *Modern Clinical Psychiatry (3rd edition)*, by Arthur P. Noyes, M. D.

Charles C. Thomas, Springfield, Illinois: *Intracranial Tumors (2nd edition)*, by Percival Bailey.

Williams & Wilkins Company, Baltimore: *Gynaecological and Obstetrical Anatomy (2nd edition)*, by C. V. F. Smout, M. D., M. R. C. S. and F. Jacoby, M. D., Ph. D.; *Medullary Nailing of Küntschers*, by Lorenz Böhrer, M. D., translated from the Eleventh German Edition by Hans Tretter, M. D.

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A FEW OF THE IMPORTANT CONTRIBUTIONS IN THE PAST TO RENAL PHYSIOLOGY*

ROBERT L. MEIERS, M. D.
NEW ORLEANS

In 1662, Lorenzo Bellini, an Italian anatomist, published the first description of the renal tubules which were for many years called Bellini ducts. Four years later another Italian anatomist, Marcella Malpighi, described the renal corpuscles, which at once became known as the Malpighian bodies. He showed that they were connected with the arteries, and guessed, but could not demonstrate, that they were connected with the tubules. Nearly two centuries elapsed before William Bowman, a 26 year old demonstrator of anatomy in London, proved by beautiful dissections that the Malpighian body is the expanded end—the beginning—of the renal tubule; that the intracapsular space is continuous with the lumen of the tubule. Impressed by the resemblance of the tubules to the acini of digestive glands, he conceived that the cells which compose their walls secrete the waste products of metabolism from blood into their lumina. The glomerular capillaries seemed to him peculiarly suited to permit the escape of water from the blood. From these two impressions he constructed the hypotheses that the urinous constituents of blood are secreted by the tubule cells and washed out of the lumen by a

saline stream flowing down from the glomerulus.

Bowman's discovery was at once confirmed by another youngster of his own age and of comparable genius, Carl Ludwig, a German physiologist. He examined the structures with the eyes of a physiologist whose ambition it was to interpret vital phenomena in terms of physics and chemistry. He saw the hydrodynamic possibilities of the arrangement of glomerular capillaries, and boldly stated that this structure must be a filter; that the beginnings of urine formation consist in the separation of a cell-free, protein-free filtrate from the blood as it passes through the glomerular capillaries, in volume sufficient to contain all of the dissolved components of urine; that this filtrate in its passage down the tubule is concentrated by reabsorption from the tubule and issues into the pelvis of the kidney reduced in volume, increased in concentration, fully elaborated urine. The significance of the work of these two young men can scarcely be overestimated. In the space of two years (1842-1844) physiology was supplied with a correct structural representation of the unit of kidney function and with two hypothetical conceptions of processes operative within it. A great part of subsequent experimental study has been influenced by these concepts and the results expressed in their terms.

During the following years, experiments instigated by Ludwig, which showed the relations between changes in rate of urine output on the one hand and changes in

*Read before the History of Medicine Society Tulane University, April 1947, awarded the B. B. Weinstein Prize, the History of Medicine Society June 1947.

arterial blood pressure or in ureteral pressure on the other, yielded results which were in harmony with this filtration-reabsorption theory. These, together with the influence of Ludwig, resulted in widespread acceptance of Ludwig's ideas. But in the years 1874-1883, work by Heidenhain, a German physiologist of Breslau, upset this view. He found that the diffusible dye, indigo carmine, injected intravenously into rabbits, is rapidly excreted in the urine in high concentration, but is not detectable in the glomerular capsules seen in sections of the kidney, excised while excreting it. Hence he concluded that the indigo carmine is not excreted through the glomerulus. It is a diffusible substance; therefore the glomerulus is not a filter, but a secreting structure with the capacity of selecting what shall pass through it.

He reduced the blood pressure in rabbits by section of the spinal cord to a level which abolished urine elimination. Then, having injected indigo carmine, he excised the kidney, found massive accumulations of dye in the lumina of tubules, concluded that it could have found access to them only through the cells of the tubules, hence these are secreting cells.

He raised glomerular capillary blood pressure, which also increases rate of blood flow, but by partially obstructing the renal vein, which decreases blood flow. He found that rate of urine flow always diminished. From this he argued that rate of blood flow through the glomerular capillaries rather than the blood pressure within them is the prime essential in the production of glomerular urine. It acts, he thought, by altering the state of nutrition of the epithelium which covers those capillaries.

He calculated the volume of filtrate from blood plasma which would be required to contain the amount of urea which a man excretes in a day. The figure arrived at was 70 liters. Of this, according to the filtration theory, some 68 liters must be reabsorbed if the day's output of urine were two liters. He did not believe that a volume of blood sufficient to yield 70 liters of fil-

trate flows through the kidneys in a day; he regarded such an uneconomical process as his figures indicated as incredible.

These facts and arguments and the skill with which they were presented caused physiologists throughout the world to recant their faith in Ludwig; and for the next thirty years the physiology of the kidney was principally taught in terms of the Bowman-Heidenhain secretory theory.

The literature of that period is a literature of debate. Neither the concept of filtration-reabsorption nor that of secretion could satisfactorily answer the objections of the one against the other. Experiments which compelled belief were lacking.

During the years from 1896 to 1917 a great deal of confusing work was published, but the work of two men stands out above the rest. Starling's classical demonstration of the osmotic pressure of plasma proteins, previously thought, because of the great size of their molecules, to be osmotically inert, was of outstanding importance. He showed that their osmotic pressure amounts to some 30 mm. mercury, that is when plasma is separated from isotonic saline by a membrane impermeable to protein but permeable to water and salt, fluid is drawn in to the plasma with an initial force of 30 mm.; or if the attempt is made to filter plasma through a membrane impermeable to its proteins, a pressure greater than 30 mm. mercury must be applied before any protein-free fluid can separate.

Starling then found that in diuretic dogs urine formation ceases when arterial blood pressure is reduced to about 40 mm.; that when the ureter is obstructed, urine continues to be formed until the ureteral pressure has risen to a level about 40 mm. of mercury below that of the arterial pressure. The coincidence of these two values, and the fact that they approximated so closely to his values of the colloid osmotic pressure of plasma, led him to think that the plasma proteins interposed an obstacle to the formation of urine of the same sort as that which they interpose to filtration through a membrane,—in a word, that a

process of filtration is concerned in urine formation.

Experiments by Bainbridge showed that whereas normal frog's urine is strongly hypotonic to plasma, when the tubules (but not the glomeruli) are poisoned with bichloride of mercury, the urine becomes isotonic. His inference was that the glomerular urine is a filtrate which is rendered hypotonic by reabsorptive processes in the tubule.

The next and probably the most important influence up to this time was the publication in 1917 of a monograph on the secretion of urine, by Arthur Cushny, then the professor of pharmacology at the University of London. When Cushny came into the field, the physiology of the kidney was made up, as he said, of "a wrangle of two great views of its activity." In a wrangle, the man who can talk the most usually comes out on top, even though his position may be insecure. It was Cushny's wish to reduce to a minimum the loose talk and confounded theories then enveloping the kidney, while expanding in some small measure the body of solid fact. With a determination that amounted almost to cruelty to theorists, he relegated their confused papers to the library where they could be allowed to continue to collect dust as was their proper fate, while he sought out and organized a few tangible facts which he thought everyone could and would believe. In a letter to Starling, Cushny wrote, "The growth in the literature on the kidney has been extraordinary since the time when you and I began to work on it, and this increase in bulk has not gone along with an improvement of quality, but rather the reverse. No other organ of the body has suffered so much from poor work as the kidney, and in no other region of physiology does so much base coin pass as legal tender. It was therefore necessary to sift thoroughly this mass of printed matter of over 6,000 pages, and I must confess that my patience has been sorely tried by some papers in which the depth bore no proportion to the length." That monograph seems cumbersome now, because from the begin-

ning the author has to fight his way through a maze of elective theories—apart from laboratory data of the first order there were no facts, not even the central idea of glomerular filtration could be set forth as a demonstrated fact. Consequently Cushny endeavored to prepare the way for the student, lest he become wholly lost in the vapors of contradictory speculation, by setting forth what he aptly called his "Modern Theory."

Accepting the premise that urine formation begins in the glomerulus with ultrafiltration, at the expense of the hydrostatic pressure of the blood, of a filtrate containing all the plasma constituents other than the molecularly gigantic proteins, Cushny sought to preserve simplicity by positing that it was the sole function of the renal tubules to reabsorb from this filtrate a fluid of constant and optimal composition, a perfected Locke's solution or protein-free plasma, in such optimal quantities as are required to maintain the optimal composition of the plasma. What was left behind in the tubules passes on into the bladder as urine. The statement that the tubules reabsorb a fluid of constant and optimal composition has been shown to be an oversimplification of what actually occurs, that is tubular reabsorption of each constituent proceeds more or less independently of the reabsorption of other constituents. Certain experiments in the 1920's by Starling and Verney and their collaborators proved quite definitely this Cushny's view to be untenable, and Rehberg submitted a great number of theoretical and experimental arguments against it.

Rehberg has especially studied the matter by means of his creatinin-method and has been able to demonstrate, in no indecisive manner, the occurrence of such variations in the composition of the resorbate, and the same result is also evident from certain investigations by Poulsson. Nevertheless, one thinks that Cushny would have been happy to have had each valuable constituent of the glomerular filtrate reabsorbed independently were it not that this explanation seemed to entail a terrifying

multiplicity of operations on the part of the tubule cells, and this multiplicity of function was just what Cushny was determined to expel from renal physiology. Multiplicity of function was apt to be interpreted as vitalism, wherein every cell operates in mysterious ways and under its own wilful determination to achieve some far-off, if not divine, event. Vitalism was still a living issue in Cushny's day, it had scarcely been expelled from nerve-muscle physiology, while many explanations of renal activity were essentially vitalistic in nature. Cushny had no desire to aid and abet this enemy of deterministic science. As he says of his monograph, "If it serves as an advance post from which others may issue against the remaining ramparts of vitalism its purpose will be attained."

Gosta Ekehorn compares Cushny's work with Swedenborg's investigations of the brain, both being instances of how the intuition of genius may be able to bridge over the defects of rather unsatisfactory evidence, so as to construe a general conception, particulars of which may be incorrect, whereas as a whole it may be verified.

Thus, some thirty years ago, physiology found itself in possession of hypothetical concepts of renal function, of an enormous mass of experimentally acquired information bearing upon these, but still unable, with decisive certainty, to answer some of the simplest, most direct questions which had been confronting her from the moment when the true relationship between glomerulus and tubule was discovered.

It was in this milieu of the Cushny renal renaissance that A. N. Richards came home from the war in December 1918. For many years before the war he had been interested in perfusion of the heart and liver, attempting to answer many circulatory and hepatic problems. In 1910 he moved to Pennsylvania as professor of pharmacology where he extended his infusion experiments to the brain and kidneys, with the help of Cecil K. Drinker.

Oscar H. Plant came to Richards' laboratory and together they completed a series of experiments in which they showed

that urine formation was related primarily to the blood pressure in, rather than the blood flow through, the kidney, thus offering a rebuttal to an argument that stemmed from Heidenhain, who had found that the rate of excretion of certain dyes is roughly proportional to the blood flow, and generally independent of the blood pressure. More noteworthy, however, was their observation that adrenalin in proper doses caused the kidney to swell, even though at the same time it caused a rise in the perfusion pressure required to maintain a constant blood flow.

This paradox was difficult to explain in conventional terms of vasomotor action, which required vasodilatation, and therefore, a decrease in perfusion pressure, as the basis for the expansion of an organ; but Richards and Plant soon resolved the difficulty by suggesting that the locus of action of the adrenalin was the efferent glomerular arterioles, constriction of which would cause swelling of the glomeruli and anterior portions of the vascular bed at the same time that it caused an increase in perfusion resistance, and therefore in overall perfusion pressure.

Then in 1917 came the war, and these experiments, except for a preliminary note, went unpublished for five years. Richards went to England as consultant to the British Medical Research Committee. In 1917-18 his investigations were confined to the study of histamine and its relation to traumatic shock. In the interval before he went across the Channel to take charge of the Physiological Laboratory of the Chemical Warfare Service at Chaumont in 1918, he also met Arthur Cushny, and the two became close friends.

Upon returning to the United States, he and Plant wrote up their experiments on the perfused kidney, guided by Cushny's analysis of the evidence on renal theory. Then in the spring of 1920 Richards was invited to give a Harvey Lecture and immediately thereafter he came down with an acute appendix. In the ensuing forced vacation he pored over his perfusion experiments and the adrenalin paradox, some

reprints of Krogh's papers on capillaries, and Cushny's monograph. Filled with admiration for Krogh's technic of direct observation of the capillaries in the tongue, foot and mesentery of the frog, he conceived that if he could see the glomeruli at work he might obtain a confirmation of the Richards-Plant adrenalin paradox, and thus in his Harvey Lecture be able to present a demonstrated fact rather than an hypothesis. When he got back to the laboratory in the early autumn he suggested the experiment to Carl F. Schmidt, then an instructor in his department.

It was not long until Richards and Schmidt were seeing under the microscope something no one had ever seen before. On the ventral surface of the kidney an occasional glomerulus could be discerned, the capsule distended with fluid, the blood cells moving in a thick stream through the active capillary loops. The most cursory examination showed that the circulation in some glomeruli was much more active than the circulation in others; and in any one glomerulus capillaries could be seen to change from a state of activity to one of inactivity. Thus Richards and Schmidt came to speak of the "intermittency" of glomerular activity and concluded that in the normal kidney not all glomeruli are active at any one time. This has not been proved to be true in man.

These studies aroused a great deal of excitement in the medical research field. Homer Smith writes, "It was all pretty exciting stuff. I can remember hearing about it in Boston, where I had just come to Walter Cannon's department as a National Research Council Fellow. In fact, I heard so much about it in Boston that for a considerable period I labored under the impression that the experiment had been done at Harvard. The basis for this confusion was probably the circumstance that Joseph Wearn, who had been an assistant resident at the Brigham Hospital, went to Philadelphia in 1921 to join Richards as instructor in pharmacology. Wearn probably sent back such glowing reports on the frog kidney, and they were received with such in-

terest, that out on Longwood Avenue the invention seemed to be indigenous." Richards showed Wearn how to look at a frog kidney, asked him to perfect himself in the technic, and to go on looking at it; but to come to him if he had any ideas. Meanwhile, Richards was drifting around and drifted into a meeting of anatomists in which Robert Chambers was demonstrating his microdissecting needle, which he used to manipulate single cells. It occurred to Richards, and he talked it over with Wearn one night, that Chambers' technic might enable them to test their explanation of the adrenalin paradox by applying the drug directly to the afferent and efferent arteriole. Wearn went farther, and suggested that they puncture the glomerular capsule, withdraw the capsular fluid and analyze it. Fired with enthusiasm, they tackled this difficult task and finally succeeded.

The full development of the micro-study of the kidney was a long and arduous affair. Fifteen years elapsed before the definitive publications on the composition of glomerular and tubular urine made their appearance from the Philadelphia laboratories. Arthur Walker joined the staff in 1925, and in later years James Bordley, John Barnwell, R. C. Bradley, Phyllis Bott, and B. B. Westfall.

Now that they were able to see the glomerulus, puncture it with a small capillary, and obtain the glomerular fluid, they were confronted with the problem of analyzing samples of .004 c.c. accurately. In a relatively short time they had developed a capillary microanalytic technic for qualitative determinations. Their results showed that the glomerular fluid obtained from the frog and the *Necturus* (mud-puppy contains no protein (as a rule); its alkalinity is of the same order as that of blood; it contains chloride, sugar, urea, phosphate, sodium, and potassium, and also some of the dyes which were used in the study of the kidney. The only conclusion that could be drawn from these results is that the glomerular fluid resembles a plasma free filtrate. What was needed was an accurate

quantitative technic to determine whether the glomerular fluid actually is or is not a filtrate. This can readily be appreciated as a task many times more difficult to develop than was the qualitative method.

While quantitative methods were being perfected, other data were being accumulated which were indirectly in agreement with the filtration idea.

H. L. White, of St. Louis, has been interested in renal physiology and has contributed a great deal of experimental work in the field. He suggested and undertook the application of Barber's method for the comparison of the total molecular concentration of glomerular fluid with a plasma-free filtrate from blood collected at the same time. It consists in the introduction of the minute droplet of glomerular fluid into a glass capillary tube, on each side of it is a similar minute droplet of plasma. The tube is sealed and measurements of the length of the three drops of fluid are made during forty-eight hours. If the middle droplet increases in length at the expense of the two adjoining ones of plasma, this means that the original molecular concentration of the glomerular urine was greater than that of the plasma, water passes from the less to the more concentrated fluid. If the middle droplet of glomerular urine decreases in size, it means that its total concentration was less than that of the plasma. More than forty experiments of this sort, made by A. M. Walker, showed them to be approximately the same.

The capacity of a fluid to conduct the electric current depends upon the concentration of ionizable salts which it contains. Hence, if two fluids exhibit the same degree of electric conductivity, this means that the number of ions per unit volume is the same in both. This was shown to be true of the frog's and mud-puppies' glomerular urine and their plasma, by L. E. Bayliss and A. M. Walker.

Finally, Richards et al, found that if suitable precautions were taken, it is possible to make quantitative estimations of the intensity of color of a very minute amount of fluid contained in a glass capillary tube.

This knowledge permitted them to find out in what concentration a dye, such as phenolsulfonephthalein or indigo carmine, is eliminated through the glomerulus after it has been injected into the blood; and they could compare this concentration with that which obtained in the blood.

Both of these dyes have been studied. Satisfactory experiments have been made on 21 frogs and in all of these the concentration of dye in the glomerular fluid is the same (within reasonable limits of error of the methods) as that which would be expected if the blood plasma were filtered through a collodion membrane.

Hayman succeeded in measuring the blood pressure in the capillaries of a single glomerulus by an application of the principle of the Riva-Rocci sphygmomanometer. He closed the neck of the tubule; through a capillary pipette in the capsular space raised the pressure within Bowman's capsule to a height at which corpuscles were seen to be flowing through only two or three of the capillary loops instead of all the six which they usually contain, and found that on the average the glomerular capillary mean pressure is 54 per cent of the aortic pressure. The average aortic pressure was found to be 37 cm. of water, so glomerular capillary pressure is about 20 cm. The colloid osmotic pressure of frog's plasma, which is the pressure which must be exceeded before a protein-free fluid can be separated by filtration through the glomerular membrane, is less than 10 cm. These figures demonstrate that the blood pressure in the glomerular capillaries is ample to produce a filtrate.

With time and patience it became possible to adapt to these small quantities of fluid a number of quantitative methods for the determination of individual constituents with highly satisfactory accuracy.

The results show that glomerular urine collected both from frogs and *Necturi* has the same composition as a plasma ultrafiltrate with respect to total concentration of solutes (vapor pressure), total electrolytes (electrical conductivity), pH, chlorides, inorganic phosphates, glucose, urea,

uric acid, creatinine, phenol red, indigo carmine, and inulin. The last five substances were injected subcutaneously or intravenously before beginning the collection of glomerular urine.

Richards stated, "These results seem to me to leave little room for doubt that, in amphibia, the glomerular urine actually has the composition of a protein-free filtrate from plasma, precisely as Ludwig had imagined 93 years ago. They show that, so far as the frog is concerned, Heidenhain was wrong in denying that indigo carmine escapes from the blood through the glomerular membrane. They give no evidence that the glomerulus possesses any capacity whatever of selecting what substances shall or shall not pass through it if only they are diffusible.

"I call particular attention to the fact that the results with inulin are wholly similar to the rest. This is a polysaccharide of high molecular weight (5100), consisting of some 32 levulose groups probably put together in the form of a chain. Its diffusibility through membranes is much slower than is that of urea, glucose, or sodium chloride, in free diffusion experiments (that is, conducted with no membrane) its mobility corresponds to that of a spherical molecule of 15,000 molecular weight (Bunim and Smith). The fact that this large and slowly moving molecule passes through the glomerular membrane at the same rate as does that of urea, which is only $1/85$ as heavy and far more mobile, yields two conclusions: one, that the passages or pores through the membrane are far larger than is necessary for the escape of the normal, diffusible constituents of plasma. The membrane is a relatively wide-meshed sieve. Another, that diffusion plays no significant part in determining the composition of glomerular urine, as I am sure it does in determining that of fluid separated from blood in the systemic capillaries."

Did the evidence permit them to believe that the glomerular process in mammals and in man is one of filtration?

(1) Microscopic study of the glomerulus in the human kidney shows no evidence of

the existence of other structures or of more complex cell structures than are to be found in the frog's glomerulus. The epithelium which invests the capillary loops of the glomerulus in man is distinctly less conspicuous than in amphibia. There is no histological evidence of the development of structures which conceivably might serve a more selective process.

(2) The older experiments of Ludwig showed that the mammalian kidney resembles a filter in its response to changes in arterial blood pressure; within limits, urine rate increases and decreases with increase or decrease of blood pressure in the renal artery.

(3) Finally, study of the renal excretion of the polysaccharide inulin gives evidence which is more than suggestive that mammalian glomerular process is solely one of filtration.

Following the completion of his quantitative studies Richards made the following statement concerning tubular activity, "When we find ourselves forced to believe that for the formation of 1 c.c. of urine per minute more than 100 c.c. of fluid are separated from the blood; that in this separated fluid are contained in twenty-four hours nearly half a pound of glucose, of bicarbonate, and two pounds of salt, little, if any, of which escape into the urine, we are compelled to realize that reabsorption is the chief task which the tubule is normally required to perform."

Visual evidence was long ago obtained of reabsorption both of base and of water. The lumen of a single tubule was distended with a dilute solution of phenol red by intracapsular injection. The tubule was blocked by pressure with a glass rod so that no more fluid could enter the tubule; that within it remained stationary. The colored streak which revealed the lumen gradually changed from a broad, lightly colored band to a narrow thread of concentrated color. Fluid was leaving the lumen, the dye was retained within it. The color remained red until the blocking rod was lifted. Then the column of fluid moved on down the tubule and its color changed abruptly to the

yellow tint, which represents acidity, at the level in the distal tubule at which, we must believe, base is reabsorbed.

Direct evidence of the existence of reabsorptive processes and of the localizations of some has been obtained in the study of the amphibian kidney.

The same methods which were successful in providing fluid from glomerular capsules in frogs and *Necturi* have also yielded supplies of fluid drawn from different levels of the tubules of these animals. The experiments were far more difficult, however, because of the tortuosity of the tubules and the fact that each is intertwined with its neighbors; because of the narrowness of the lumen, and the necessity of avoiding collection of fluid which had flowed past the point of collecting pipette; because of the necessity also of accurate identification of the site of puncture with reference to the nephron as a whole. A single nephron was identified by injecting dye into Bowman's capsule and watching its passage through the tubule; the deposition of a globule of mercury or oil in the lumen at a point immediately distal to the point of the pipette prevented reflux; a camera lucida scale drawing of the punctured tubule was made by filling its entire lumen with india ink, fixing the kidney, and clearing the part containing it. The puncture hole was easily visible in the cleared preparation, and measurements of the distances to the ends of the segment of tubule in which it occurred were accurately made. Obviously the analytical methods developed in connection with the glomerular problem were equally applicable to fluid from the tubule.

One group of results shows that the glomerular filtrate passes through the entire length of proximal convoluted tubule with little change, either in the total concentration of dissolved substances or in the concentration of chloride. It is only during passage through the lumen of the distal convoluted tubule that the total concentration and the concentration of chloride diminish. From these analyses it is possible to assert that the selective, active reabsorp-

tion of NaCl in amphibia is a definite function of the distal and not of the proximal convoluted tubule.

In striking contrast with the behavior of chloride is that of glucose. As soon as the glomerular filtrate has progressed an appreciable distance along the proximal tubule, its glucose content is significantly diminished. When half-way through, the reabsorption appears to be complete or nearly so. Special experiments in which glucose solutions were perfused through the distal half of the proximal tubule and also through all of the distal tubule showed that the capacity of reabsorbing glucose is possessed by all of the cells of the proximal tubule, but not by any of the cells of the distal tubule (Walker and Hudson).

The reaction of the fluid in the tubule remains essentially the same as that of blood plasma during its progress through the entire proximal tubule (Montgomery and Pierce). At a certain point in the distal tubule it begins to become acid. By injecting indicator solutions (phenol red) into the distal tubule, Montgomery found that the cells which are responsible for the acidification of urine are localized in a region corresponding roughly to the middle third of the distal tubule. There are the best of reasons for believing that reabsorption of base from the tubular fluid is responsible for its acidification.

These reabsorptive processes are abolished when the tubule cells are poisoned as by hydrocyanic acid or mercurous chloride. They are not to be explained by diffusion or by any other familiar physical process. They continue to operate when the fluids within and without the tubule are of identical composition, that is, when no initial diffusion gradients exist.

But there remained the vexing question of tubular secretion: did it actually exist, and if so, what part did it play in the formation of urine?

It might seem that the micro-study technique would quickly answer this question, but the answer was not so easy to attain. Recognizing that highly varying quantities of water are reabsorbed from the glome-

ular filtrate as it passes down the tubules, one cannot say from the degree to which any particular constituent is concentrated over and above the original glomerular filtrate (or, if you wish, the plasma) whether that degree of concentration is due to tubular secretion or merely to the reabsorption of water. Even if tubular secretion is dismissed, one cannot say whether various urinary constituents have been in part reabsorbed. What is required in order to answer the question is a standard of reference for water reabsorption, some substance which can be demonstrated to be neither reabsorbed nor secreted by the tubules; then from the degree of concentration of this standard of reference one can determine the extent of reabsorption of water, and hence whether any other substance has been reabsorbed or secreted. But before that standard of reference was to come, the question of tubular secretion was destined to be answered in the affirmative by E. K. Marshall, Jr.

Trained as a chemist before he went into medicine at Hopkins, Marshall's development of the urease method in 1912 had led him, in collaboration with D. M. Davis, to make observation on the distribution of urea throughout various organs in the body. One day Marshall and Davis happened upon two dogs which had been adrenalectomized by Samuel Crowe, and discovered the marked retention of urea which follows adrenalectomy. This led them into a study of the influence of the adrenals on the kidneys and, prior to the War, in collaboration with A. C. Kolls, Marshall had started a series of experiments designed the influence of the nerves on renal function, experiments which were set aside when he took up work on war gases in New Haven in the summer of 1917. Here, however, he read Cushny's monograph and came to feel that some of the results which he and Kolls had obtained were incompatible with a simple filtration-reabsorption theory.

The war over, and gas warfare no longer of interest, Marshall returned to Hopkins where with Kolls he published their pre-

war experiments, with additions, in 1919. By this time Marshall had become intrigued with the ambiguities and mysteries of tubular function, and in 1923 he and J. L. Vickers published a paper entitled "The Mechanism of the Elimination of Phenolsulfonophthalein by the Kidney, a Proof of Secretion by the Convolted Tubules." This proof consisted of the demonstration that after intravenous injection of phenolsulfonophthalein the dye accumulates in the cortex of the non-secreting kidney at a time when the blood pressure is too low to permit the formation of significant quantities of filtrate; and, second, that the dye is to a great extent absorbed or combined with plasma protein, only a small fraction being filtrable; consequently, the quantity of free and filtrable dye in the plasma is inadequate on any acceptable estimation of the rate of filtration to account for the total quantity excreted in a given time. This was the first actual demonstration of tubular secretion.

These experiments were followed in the next year by a paper by Marshall and Crane, adding new and equally convincing evidence, in the demonstration that as the plasma level of phenol red is raised the rate of excretion ultimately levels off and approaches a constant, maximal value; this result is incompatible with a theory of exclusive filtration, but is explicable in terms of filtration plus tubular secretion, the secretory cells becoming saturated at higher plasma levels. At this same time Mayers adduced equally good evidence for the secretion of uric acid by the chicken kidney; the quantity excreted at a given plasma level being inconceivably greater than could be excreted by filtration alone, under any plausible assumption concerning renal blood flow and filtration rate.

Here, in effect, the matter stayed for several years. Proponents of the Cushny theory remained skeptical of Marshall's phenol red experiments, while the proponents of tubular secretion became skeptical of their opponents' reason. Then in 1926, Marshall, browsing through comparative anatomy, discovered that a number of

fishes had been described which possessed purely tubular kidneys. This fact, of course, immediately evoked Marshall's interest in fish urine.

Work on the aglomerular fishes had been undertaken independently by J. G. Edwards in the Naples' laboratory, and within a short time it was clear that this purely tubular kidney, which does not even possess a significant arterial blood supply but is perfused entirely by venous blood from the renal portal vein and at a pressure which is probably below the osmotic pressure of the plasma proteins, can excrete all the ordinary urinary constituents: water, creatine, urea, uric acid, magnesium, sulfate, potassium and chloride; and, among foreign substances, iodide, nitrate, thiosulfate, sulfocyanide, indigo-carmin, neutral red and phenol red. About the only three important things it would not excrete were ferrocyanide, protein and glucose. Marshall recalls this negative discovery as the high point of his experiences in renal physiology.

So, by 1930, the question of tubular excretion was answered in the affirmative. But, as Richards said, "At last he has found an animal that fits in with his theory!" To prove tubular excretion in an aglomerular fish or the tubular excretion of phenol red in the dog, was only to prove the possibility of tubular excretion in other animals; the demonstration really answered no questions so far as the frog or man was concerned, for conceivably the situation might be different in every species, and certainly it would differ for different substances. Further progress required that a standard of reference by which water reabsorption in the tubules, or to use the corollary of this statement, the rate of glomerular filtration, could be measured.

Actually certain European investigators had already made considerable advancement in this direction, but their work had not gained popular recognition in this country. The most outstanding achievements were those of Rehberg when he developed the creatinine clearance test by which he compared the relative clearance of other

substances, namely urea. Other European workers who deserve a great deal of credit are Poulsson, Ekehorn, Starling, and Verney. Ekehorn has been a constant worker and writer in the field of renal physiology for many, many years particularly in the *Acta Med. Scandinavica*.

Returning to the efforts of this country, we find that workers had been attempting to utilize urea in determining kidney function since the early 1900's, with little or no success. About 1921 Thomas Addis and D. R. Drury demonstrated that the rate of urea excretion divided by the urea content of the blood was fairly constant if the urine flow was maintained at high levels by water diuresis. Addis thought that the administered water increased the excretory capacity for urea by a nervous or humoral mechanism; actually the diuresis itself, by reducing the back-diffusion of urea, appears to be the chief factor in explaining the constancy of the Addis index under these conditions. But the administration of water apart, the constancy of the Addis ratio still had no explanation in renal physiology. One of the chief results of Addis' observations was to force the quantitative mode of thinking into experimental renal physiology in this country.

Van Slyke, working with Austin and Stillman, and later with Moller and McIntosh at the Rockefeller Institute, showed that excretory efficiency of the kidney could be expressed simply as the volume of blood cleared of urea by one minute's excretion. They called this volume of blood the urea clearance. With moderate or abundant diuresis, they found that the kidneys of a normal man excreted on the average the amount of urea contained in 75 c.c. of blood were cleared per minute. If the kidneys were damaged by disease, they cleared less blood of urea per minute; in uremia only 3 or 4 c.c. or less. The urea clearance was found to be a sensitive clinical measure of renal function. Visualizing, as in a measuring cylinder, the volume of blood which represents the clearance makes it possible to use a mental photograph in place of a mathematical formula.

The clearance is calculated as (mg. urea excreted per min.) (mg. urea in 1 c.c. of blood). If 15 mg. of urea, for example, are excreted per minute and the blood urea is 0.2 mg. per c.c., the clearance is $15/0.2 = 75$ c.c. of blood per minute.

In recent years the word "clearance" has broken loose from the excretion of urea and, taking conceptual wings, has become a generalized notion applicable to all aspects of renal excretion. For example we now say that the clearance rate for sulphate is 10 c.c., for potassium, 20 c.c.; urea 75 c.c.; inulin, 130 c.c.; phenol, 760 c.c.; and diodrast, 120 c.c., without knowing how the kidneys clear the blood of these substances, whether by filtration plus tubular reabsorption, filtration without tubular reabsorption, or filtration plus tubular excretion.

Realizing the need for a substance which could serve as a standard of reference for water reabsorption in the tubules, Smith and Jolliffe and later Shannon attempted to find such a substance, a search which led, after a false start with ferrocyanide and xylose, to the use of inulin. They were able to demonstrate that inulin was filtered by the glomerula and not reabsorbed or secreted by the tubules. Now they had acquired a trustworthy method for measuring the rate at which the glomerular filtrate is formed and delivered into the proximal ends of the tubules. The amount of inulin excreted in the urine in a minute divided by the amount contained in 1 c.c. of plasma (that is, plasma filtrate) gives the volume of filtrate in c.c. per minute. Working at the New York University Medical College, they made many such determinations which show that for adult man under basal condition 120 c.c. per minute is the average rate at which glomerular urine is formed. This value is obtained whether urine is being excreted at the rate of 0.5 c.c. per minute as a result of water deprivation, or 15 c. c. per minute because of excessive water intake, or an intermediate rates.

Other carbohydrates such as mannitol, sorbitol, dulcitol, and sucrose have also been

found to be excreted by filtration alone in the normal animal. Phlorizin blocks the reabsorption of glucose and brings the glucose clearance up to the level of the filtration rate. The creatinine clearance in both the normal and phlorizinized dog is identical with the simultaneous inulin clearance, but in normal man (and apes) the former is about 30 per cent higher, indicating that in addition to filtration, some creatinine is cleared from the blood by the tubules, as is the case in many of the lower animals. Phlorizin blocks this tubular excretion and brings the total creatinine clearance down to the level of the filtration.

If, as in the case of creatinine, the clearance of any substance, such as phenol red or diodrast, is greater than the simultaneous inulin or mannitol clearance, it can only be because some of that substance is cleared by the tubules, in addition to that which is cleared through the glomeruli. But there must be a limit even to the process of tubular clearance: we cannot clear any substance from a larger volume of blood than actually perfuses the kidneys. The clearance of diodrast in normal man, calculated as whole blood, is approximately 1200 c.c. per minute—one fourth of the total cardiac output. Obviously, this must be close to the total renal blood flow; that is, the extraction of this compound from the renal blood must be very nearly complete and for practical purposes we may take the diodrast clearance as identical with the renal blood flow.

In 1934 at a meeting of the Society of Experimental Biology and Medicine, Smith and Richards discovered that they were working on the same problems and with the same motives and the same substance—inulin.

In 1935 Shannon, studying phenol red excretion in the dog, showed, in accordance with the surmise of Marshall and Crane, that at high plasma levels the tubules do indeed become "saturated" and excrete the dye at a constant maximal rate. This maximal limitation in tubular excretion has subsequently been demonstrated for diodrast and number of other substances in both

dog and man, and may be considered to be a characteristic feature of tubular activity.

It was also in 1935 that Goldrin, Clark, and Smith pointed out that the phenol red clearance at low plasma levels, where the tubules are not approaching saturation) afforded a close approximation to the renal blood flow. In 1937 Goldring, Chasis and Smith showed that the clearance of diodrast, the tubular excretion of which had been demonstrated by Elsom, Bott and Shiels in Richards' laboratory, afforded a closer and quite satisfactory measure of the renal blood flow; and further that the maximal rate of tubular excretion of diodrast (or diodrast Tm) could be used to characterize the total quantity of functional tubular tissue in the kidneys, independently of the blood flow or filtration rate. In 1938 Shannon, Farber and Troast showed that a similar, limiting maximal rate characterized the reabsorption of glucose by the tubules and, in line with diodrast Tm, they called this term glucose Tm. The application of the methods for the measurement of blood flow and filtration rate together with the saturation methods (diodrast Tm and glucose Tm), opens new avenues of approach to the study of the distribution of blood or glomerular filtrate among the functional units of the kidney.

There are several other aspects of renal physiology, which because of their more recent discovery and because of their tendency to change, do not lend themselves well to historical retrospection.

As an example of this, ammonia formation may be cited. For many years urine ammonia was believed to be derived from urea. Recently, however, it has been shown that the majority of the ammonia is derived from the deamination of glutamine by the action of the tubular cells. A small amount is derived from adenosine by the same process; additional studies are, at present, active on this problem.

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THE VALUE OF THE CYTOLOGIC SMEAR IN THE DIAGNOSIS OF CANCER

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NEW ORLEANS

Within the past few years the medical profession and the various cancer societies have been bombarding the public with the information that cancer can be cured—if diagnosed in the early stages of the disease. The cytologic smear is a new tool through which we hope to make possible the earlier diagnosis of a number of malignancies to which this method is applicable. Let me say at the outset that we who are working with this method have no idea of using it to supplant the biopsy. The positive cytologic smear should, whenever possible, be confirmed by biopsy. Only by doing this can we ever hope to establish the proper role of the smear as a reliable diagnostic procedure.

We, of the medical profession, realize

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that our present modes of treatment for malignancies are effective only when our diagnoses are made in the early stage of the disease. Let me take for example the statistics of Garcia and Schlosser who made a survey of five-year survivals in carcinoma of the cervix treated in one year at Charity Hospital. They found that when the malignancy had reached the second stage before treatment was instituted, the five-year survivals were only 51 per cent. Unfortunately in this series, as in most surveys, we find that the majority of the patients did not present themselves for treatment until the malignancy had reached the second and third stages in which the salvage rates are so very low. Earlier diagnosis of cancer is essential if we are to lower these horrible statistics. Any method through which we are enabled to make an earlier diagnosis of cancer deserves our most serious consideration. This we hope to accomplish in some measure by means of the cytologic smear.

The cytologic smear has several limitations as a general diagnostic procedure. First, as its name implies, it is applicable only to those regions of the body which produce material from which a smear can be made. And second, we must make our diagnoses from the characteristics of desquamated cells and groups of cells without actually seeing the invasion of tissue by these malignant cells. On the other hand, the advantages of the method are numerous.

1) First, there is the simplicity of obtaining material. The only equipment needed for the vaginal smear is a slightly curved glass pipette with a rubber bulb, several slides with paper clips at the ends to keep them separated, and a bottle of alcohol-ether fixer.

2) Obtaining the smear is not unpleasant to the patient. Because of this, the method can be used to screen large numbers of patients. For urine and sputum examinations only the fresh or preserved specimen is needed.

3) Hospitalization is not necessary for obtaining the smear.

4) The test is inexpensive to the patient—the cost being no greater than that of the usual laboratory procedures.

5) The staining time is short; however, the examination time is longer than that of the usual biopsy.

6) The smear can be repeated as often as necessary, and is therefore excellent for the follow-up of suspicious cases.

7) The smear is an excellent method for following cases after surgery or radiation.

8) The smear often picks up carcinoma *in situ* before the appearance of symptoms or lesions, and is often positive before any other test is diagnostic.

9) The smear offers no conflict with other well established diagnostic procedures, often complements them.

10) The vaginal smear often gives other information about the patient, such as the endocrine status, and shows the presence of many types of infection.

11) The smear is a reliable test in the hands of trained men—and women!

The vaginal and endocervical smears are at the present time recognized as accurate tests for diagnosis of carcinoma of the uterus and vagina. The original work of Dr. George Papanicolaou has been confirmed by many groups of workers, including Ayre, Meigs, Gates and Warren, Isbell, and many others. The cytologic smear is now a routine procedure in cancer detection clinics all over the country. The following chart shows a series of 5329 cases

VAGINAL SMEARS RELATIVE ACCURACY OF DIAGNOSIS					
	NUMBER OF CASES	PROVED CANCER CASES	PERCENT FALSE POSITIVE	PERCENT FALSE NEGATIVE	TOTAL ERROR
PAPANICOLAOU AND TRAUT	3014	194	0	6	0.3%
MEIGS ET AL	1015	154	2.9	10.3	4.0%
GATES AND WARREN	1300	81	1.3	23	2.5%
TOTALS	5329	429	0.7%	0.6%	1.4%

Figure 1

of Papanicolaou, Meigs, and Gates and Warren, showing a total error of 1.4 per cent. Isbell and his coworkers report in the October 1947 issue of the American Journal of Obstetrics and Gynecology, a series of 1045 in-patients whose preoperative vaginal smears checked against postoperative pathologic tissue diagnoses reveal a total error of 1.5 per cent. The error in all these series is largely due to false negative reports in cases of adenoma malignum which does not exfoliate, and carcinoma *in situ* of the fundus.

My own small series of 114 gynecologic cases compares somewhat with the aforementioned statistics, showing at present a total error of 1.7 per cent. Of these 114 cases, 3 were called positive for carcinoma and 4 suspicious. Of the 3 called positive by smear, the biopsies on 2 were positive and the third is now being studied. One case gave a history suggestive of malignancy, one had only a slightly discolored discharge, and the third was completely asymptomatic. Of the 4 cases called suspicious, 2 were negative on biopsy. The first case was a patient with a chronically diseased bleeding cervix that showed cells with very large nuclei on smear. One of our outstanding gynecologists inserted radium immediately after taking a biopsy, sure in his own mind that the cervical lesion was malignant. You can imagine our amazement and discomfort when the biopsy returned with the diagnosis of chronic cervicitis. The second case considered suspicious was that of a severe atrophic menopause with many atypical degenerating cells. Both of these errors were made in the early phase of this study. The other two suspicious cases were also classed as suspicious by Dr. Papanicolaou and are still under observation.

The idea that malignancies of the lung can be diagnosed by finding exfoliated cancer cells in the sputum is not new. This was first described by Field in 1860. Wandall of Copenhagen, an international authority on cytologic diagnosis of carcinoma from sputum, has been in this country studying the technic of Dr. Papanicolaou.

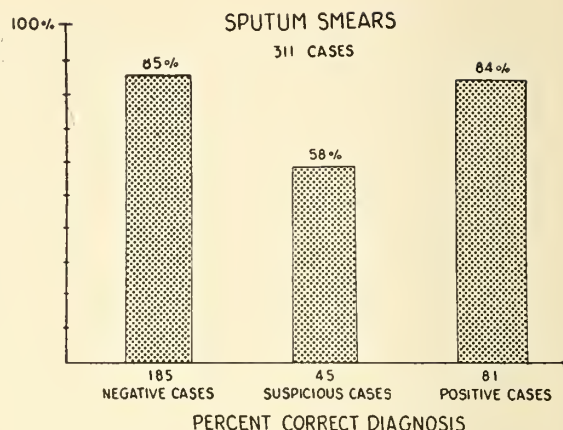
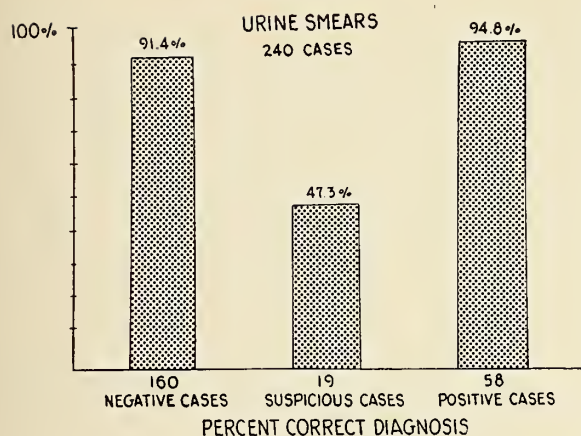


Figure 2

The figures of Wandell and Papanicolaou are in agreement, both having found malignant cells in 84 per cent of cases of cancer of the lung. It is to be hoped that as work progresses in this field positive findings will be even higher. We know that it is possible to obtain positive sputum in some cases before the x-ray shows a lesion. We know too that the cytologic smear is particularly of value in the diagnosis of upper lobe lesions where the bronchoscope can not be used. My own series of cases on sputum is too small to be of any statistical value, but thus far no false positive diagnoses have been made, and, I hope, no false negatives. As to material used, Herbut and Clerf prefer bronchial aspirations, but Dr. Papanicolaou finds that sputum, if correctly obtained and preserved, will reveal just as high a percentage of positive smears.

Diagnosis of malignancies of the genitourinary tract by cytologic smear has been made possible by the technic of Dr. Papanicolaou. We are sometimes able to indicate by smear the probable site of the malignancy, and sometimes we can report only that malignant cells are present. A negative smear of urine is considered at the present time to be 91 per cent correct, and a positive smear 95 per cent correct. The urine presents a technical problem not encountered in working with other smears. There is so little mucus in the sediment that it is difficult to make the sediment stay on the



slide through the staining process. In the East, the technicians coat their slides with a layer of Mayer's albumin before smearing the sediment. I have found Southern urine to be extremely obstinate, and have resorted to mixing the sediment with a small amount of albumin, and thus obtain better results. Catheterized urine is preferable to voided urine as it contains more cells. My own observation is that diagnosis of malignancies of the genito-urinary tract is more difficult than vaginal, sputum, gastric, or exudates, in that there are more pitfalls to be avoided, and single cells are found more often than cell clusters.

Diagnosis of carcinoma of the stomach offers more technical than diagnostic problems. The stomach presents difficulties because of its secretory, digestive, and ingestive functions. Some carcinomas of the stomach are not exfoliative growths, and these will always be missed by smear. The best smears are obtained in cases having achlorhydria. At the present time positive smears have been reported in two-thirds of proven cases of carcinoma of the stomach by two groups of workers.

As to diagnosis of malignancy from ascitic and pleural effusions, no large series has been reported thus far. Dr. N. Chandler Foot, surgical pathologist at Cornell, believes that the cytologic smear will reveal more accurate results than the older method of embedding and sectioning the sediment,

as the smear technic causes no slicing or distortion of cells. In my group I have given no false positive reports, but did give a false negative report, knowing when I did that it would be incorrect. This smear was made from a sample of ascitic fluid from a suspected carcinoma of the ovary. The smear showed many RBC and lymphocytes but no malignant cells. The autopsy diagnosis was carcinoma of the ovary with abdominal metastases.

In conclusion, I should like to repeat that the cytologic smear is no substitute or short cut for our older methods of diagnosis. It is a new, accurate, and accepted tool to be used with our other procedures in our ever-continuing fight against cancer.

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ENCEPHALOMYELITIS, EASTERN TYPE, IN LOUISIANA*

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BATON ROUGE

The purpose of this paper is to review what is known of the disease with specific reference to the outbreak that occurred in Louisiana last year.

Equine encephalomyelitis, or sleeping sickness, is an infectious disease caused by a neurotrophic virus and characterized by derangement of consciousness, motor irritation, paralysis, and a high mortality. In the United States two types of virus have been recognized, a highly virulent eastern and a less virulent western type. Natural infection in this country has been observed chiefly in horses, but natural epidemics in humans, pigeons, and pheasants have also been observed.

In 1931, Meyer and his associates isolated the virus during an outbreak that year in

California, and in 1933 the virus was isolated during an outbreak in the New England States. These were proven to be immunologically distinct; thus the eastern and western terminology was adopted. Since that time the eastern virus has moved westward and the western virus has spread eastward, resulting in a majority of states having both eastern and western type virus present. Louisiana is one of these states.

The seasonal occurrence of the disease has been from June to November, or the first appearance of frost, thus corresponding with the incriminating data against the blood sucking insects, as it is during this time of year that the insects are more numerous. Mosquitoes have been shown experimentally capable of transmitting the disease and have been found naturally infected with the virus during outbreaks of encephalomyelitis. This was true in last year's outbreak in Louisiana. Dr. Kelser's work revealed that a five to six day interval must elapse before the mosquito is capable of transmitting the disease after having fed on infected blood. It is thought that during this time the virus undergoes maturation or multiplication. The mosquito after becoming infected with the virus remains capable of transmitting the disease all the rest of its life. With this in mind it can readily be understood that winds can easily spread these infected mosquitoes over many miles and in all directions. It has also been shown that the Rocky Mountain spotted fever tick, *Dermacentor andersoni*, is capable of transmitting the virus through the egg to the offspring, thus probably acting as a reservoir of infection. However, humans, horses, chickenmites, and migratory birds have all been considered possible reservoirs but as yet no definite proof has been found. The course of the disease is from a few hours to a few days. At the height of the outbreak death usually occurs in from two to four days. A few drop dead without showing previous symptoms. The mortality in the western type of the disease is about 40 per cent while that of the eastern type is 90 per cent and higher. In Lou-

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isiana last year there was a 98 per cent mortality.

The period of incubation is from one to three weeks. The first or febrile stage of the disease usually goes unnoticed by the owner of the horse, but the temperature may run from 103 to 106° F. It is during this time that the virus is present in the blood stream. The virus then makes its way to the central nervous system and the dominant symptoms of psychic derangement, motor irritation, and paralysis reveal themselves. Mental depression in some form, from dullness in the early stages to complete coma near the end, is an almost constant symptom. Motor irritation is commonly present. Especially noticed are clonic spasms of certain groups of muscles, and involuntary forward or circling movements. Paralysis of the throat is always present, resulting in the accumulation of food and saliva which gives rise to a fetid odor and a nasal discharge. The paralysis finally becomes complete and death ensues.

Upon postmortem there are no gross diagnostic lesions. In the eastern type, histological examination of the brain reveals perivascular lymphocytic infiltration and degeneration of the nerve cells being more pronounced in the cerebral cortex. Similar changes are produced by the western type of the virus, but to a lesser degree of intensity.

A clinical diagnosis of encephalomyelitis can be made on its epizootic nature, seasonal occurrence, and symptoms of derangement of consciousness and paralysis. Botulism, commonly confused with encephalomyelitis, is usually confined to one farm. The symptoms of paralysis are present, but encephelitic symptoms are usually absent.

A differentiation between eastern and western types of encephalomyelitis can be made clinically because the symptoms of the eastern type are more severe than those of the western type. The course is much shorter and there is a higher mortality in the eastern type.

A laboratory differentiation is made by means of animal inoculation, using guinea pigs, mice, or rabbits. Serum protection

test, that is inoculation of these animals with serum of specific type followed with injection of fresh brain tissue, also the complement fixation test may be employed for the purpose of determining the type of virus.

Treatment of the sick is entirely symptomatic. Anti-equine encephalomyelitis serum is of doubtful value. If the animal is unsteady but still able to stand, slings or similar support are recommended. Water is given twice daily through a stomach tube, and this may be supplemented with physiological saline 1000 c.c. or dextrose 40 per cent solution, 500 c.c., given intravenously daily. Various drugs and products have been recommended, but have been found to be of little or no value.

Very few animals were treated in Louisiana during the outbreak because of the futility of the treatment. The veterinarians thought it more important to spend all their time vaccinating unaffected animals in order to prevent the spread of the disease.

Following the discovery that the virus could be inactivated by formaldehyde solution without destroying its antigenic properties and that it could be propagated in chicken embryos, a very effective vaccine has been developed. The present day product consists of formalin-inactivated suspension of virus bearing, chick embryo tissue.

For the prophylatic vaccination of horses, the vaccine is administered intradermically in two doses seven days apart.

It might be said that during the height of the outbreak in Louisiana, many horses and mules came down with the disease between the time of the first and second injection. This was probably due to the fact that these animals had the disease in the incubative stage at the time of the initial injection. The immunity resulting from the two injections of vaccine persists for six months to one year. Because both the eastern and western type virus are found in Louisiana, it is necessary to use bivalent vaccine which is a vaccine made from both eastern and western type virus.

In Louisiana last year the disease made its first appearance near Crowley during

the latter part of June. In little more than a month's time it had spread all over the southwestern parishes (fourteen in all) with sporadic cases in surrounding parishes. When the disease disappeared in October, we found that some 5,000 horses and mules had died from the disease and approximately 65,000 animals had been vaccinated.

In hopes of preventing another outbreak this year, the Louisiana Livestock Sanitary Board is recommending that the farmers have their horses and mules vaccinated early, so that the last injection of vaccine is given not later than May. The Board has also recommended that all horses and mules be sprayed every twenty-one days with DDT solution, in order to control the mosquitoes that feed on these animals, and spread the disease.

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CHOICE OF METHOD OF TREATMENT OF PSYCHIATRIC PATIENTS*

SAMUEL BARKOFF, M. D.

NEW ORLEANS

Psychiatric treatment aims to help the individual direct his activities so as to achieve increased satisfactions which are appropriate to his environment. This does not mean that ideally the psychiatrist hopes to help his patient conform to all of the demands of his family, his friends and of society but rather to help him to achieve a more comfortable balance, be more able to make his own decisions, and having made them, to be satisfied with them. There are positive forces in the direction of mental health in most persons which involve a continuous integrative process. However, the environmental forces of early life may have badly disturbed the direction and pattern of this integrative process so that the individual continues to exhibit infantile or childhood patterns which are very much out of keeping with adult status. The person who insists on remaining in bed to escape un-

usual pressure at work is in reality regressing to a form of infantile behavior.

A person may often display a seemingly good adjustment to his environment until some catastrophe or increased responsibility makes a demand he is unable to cope with and he is then compelled as the only possible adjustment available to resort to a more infantile mode of behavior. For example, a fifty year old railroad clerk had to be hospitalized after the death of his mother. He had been a quiet, sedate person, devoted to his mother, who in turn took care of his needs even to the extent of planning his vacations and purchasing all his clothing. He felt helpless without her, became very agitated and repeatedly asked, "What shall I do, what shall I do? Please help me". He was really just like a small frantic child and there was actually a childish whine in his voice.

Involved in the therapeutic process is the necessity for the patient to recognize the nature of his own behavior.

The two brief illustrations given bring out an important point. It is very hard for anyone to accept the fact that he is behaving immaturely. It is quite a blow to one's self-esteem and often very painful. Patients would prefer believing they have physical symptoms to accepting that theirs is a behavior pattern more fitting a small child.

The need for early therapy is of utmost importance for the avoidance of fixations of infantile behavior patterns with their increasing distortion and displacements, and the danger of further regression. These make for a more difficult treatment situation. This is indeed obvious in such disorders as the phobic states where the limitation of activities tends to increase or in the obsessive-compulsive disorders where there are further symptoms which develop as extensions of the earlier symptoms.

Today, the psychiatrist is expected to offer more than just a diagnosis with perhaps a recommendation for sedatives and rest or a demand that the patient give up his foolishness. Too often such a procedure leaves the individual emotionally in exactly the same situation as he was when his re-

*Read at Meeting of the Orleans Parish Medical Society, January 26, 1948.

gression or disintegration began. In the event of prolonged rest, a somewhat better physical condition is achieved and a feeling of new psychic strength arises. The patient now has the energy to bang his head harder than ever against the same psychological brick wall. Therapy must be aimed through the understanding of the dynamics of his illness at helping this person past what appears as an impregnable barrier.

Many problems seem very simple to everyone but the person involved. "Why don't you use your common sense and leave your husband?" is repeatedly asked of the wife of the alcoholic when she seeks advice. Most likely, the real reason why she married him in the first place and why she is compelled to hang on to him will remain a mystery to her. If eventually she can be brought to understand the part played by her masochistic tendencies, her guilt feelings, her identification with her husband and her inferiority feelings she can then permit herself to make suitable decision about her future course. People will use common sense only if they are in the proper psychic situation to do so, and the work of the psychiatrist is to help them reach a position where reason can function.

How do we go about putting the individual in a position to make suitable decisions? Obviously, some persons are so disordered that the possibility of reintegrating is very poor and protective care is of immediate importance for both the community and the person.

The diagnostic interviews are of utmost importance in several ways. First, we learn the patient's concept of the development of his disorganization and the nature of his malfunctioning as he understands it. His behavior and approach to the interviews gives us an idea of his ability to handle situations, his capacity to relate to other persons, the techniques he uses in establishing relationships and lastly an idea of his readiness to accept help. The diagnostic interviews are themselves of therapeutic value in that many patients find it not too difficult to develop new insights if able to talk to someone who in a non-judgmental,

non-critical atmosphere can help them. A rapid resumption of healthy functioning often occurs especially when the person is seen at the beginning of his difficulty and before he has begun to mobilize his more infantile approaches.

Many individuals are so afraid to handle new insights that attempts to guide them even slowly are often of no avail. They are so fearful of their own emotional drives, and experience such pangs of guilt that they can only tolerate a therapist who will approve of their mishandling of the situation. Frequently, they are seeking an organic basis for all their troubles and reject any physician who fails to agree with them. The slightest variation in blood pressure, blood count or basal metabolic rate may be pounced on as the cause of every difficulty.

Other persons may show their resistance to therapy quite early in the diagnostic process by finding all kinds of obstacles to treatment. Occasionally their reasons for objecting are valid but more frequently they are not. While some patients raise objections to the fees involved, the time required, the inconvenience of appointment hours, the distance traveled, and so forth, it is amazing how others in more difficult circumstances overcome these obstacles. Frequently, we are faced with those who make impossible demands in regard to time of appointments or fees, those who repeatedly break, forget or arrive late to appointments, and those who demand that the therapist immediately give them the answer to all their problems or quickly remove a disabling symptom. Experience has repeatedly brought out that the psychiatrist will not help his patient if he tries to concede to these unreasonable demands. It is necessary to expose these demands as forms of resistance to therapy before effective treatment is possible.

The management of the patient who rejects therapy is usually difficult when the patient previously has had an authoritative source to support him in his own distorted viewpoints that he is organically ill or that psychotherapy is dangerous. The fact is, of course, that it is extremely rare for a

patient to become worse in the hands of a competent psychotherapist. This may happen when the person is already at the point of complete disintegration or very rapidly headed that way at the time the psychiatrist is consulted. Experience has shown that the very fact that someone has demonstrated an interest in helping another person is nearly always of some value. Many persons who bitterly complain about a previous therapist admit later that actually they profited from the experience.

An evaluation of the degree and type of rigidity of a patient's personality structure is of importance in planning therapy. Some persons are so unapproachable by means of the ordinary therapeutic interview that the psychiatrist must limit his help to recommendations about daily routine, vacations, changes of work or residence, or the use of sedation in periods of stress. When the patient is greatly disturbed or depressed, shock therapy may be indicated and even periods of hospitalization. These are at best, aids or poor substitutes for the intensive interviews as the method of treatment.

As I have already suggested, the interview involves more than just talking. It is typically a combination of two persons working together on one set of problems. Intellect, experience and understanding, emotional maturity, intuitiveness and patience are the factors that play the major roles. The patient is really making use of the therapist's strengths in these qualities to supplement his own.

The therapist's role is far from being a passive one in the interviews. Because of the complexity of his patient's performances, he must do a great deal of listening and observing. In some instances his role may be largely one of encouraging and offering support. At another time the approach may be an inquiring one, perhaps, even to the point of demanding information. When the patient expresses a feeling of being weak and helpless, it may be necessary for the therapist to decide whether to be frustrating or supportive. The therapist needs to be able to evaluate whether the patient is capable of handling a given situa-

tion and upon this depends his choice of technique at that point. If the therapist feels the patient is able to make the next move it may be necessary to focus attention on the particular problem involved, repeatedly bringing the patient back to the problem when he avoids it.

Psychotherapeutic interviews may be categorized in two main types. In the first, only limited insight is possible, advisable or feasible, and this may be called limited psychotherapy. The second type is psychoanalysis. In limited psychotherapy, the approach may be largely supportive as may occur when the patient is faced with an unhappy or unfortunate situation and needs support to enable him to carry on his daily routine. The principal aim in such situations is largely the avoidance of regression. Again, when time may be a factor, the therapist may make suggestions or approve or encourage a course of behavior. Situations may be discussed without attempts to go too deeply into the past or without too much bringing in the patient-physician relationship on the part of the therapist. There are occasions when the patient insists on doing so, or when it is absolutely necessary to discuss these relationships in order to make possible or to maintain even a limited contact. Limited therapy as described is rarely an adequate substitute for psychoanalysis. Very often, however, it does enable a patient to carry on fairly well but there still remain many conflicts which would be better resolved in the long run. It is true that many persons, after limited therapy, will function better than they did before and feel no further need for treatment. The usual occurrence is that the resolution of the more superficial conflicts allows the more deeply repressed conflicts to come to the surface and this makes further therapy almost a necessity. Although such persons are actually functioning better, they have come to recognize the existence of underlying anxiety, of their poor handling of instinctual drives, their hostilities towards others and their unsatisfactory interpersonal relationships. The persons who manage to stop at this point

usually have some aim such as marriage or a new position that may serve as a new source of satisfaction. In many instances we find that this breaking of the ice offers sufficient satisfactions to some persons and their need for further therapy ceases. Contrary to common belief, limited therapy really requires much more skill and experience than does psychoanalysis. The average course of psychoanalysis is two to three years during which the subject has interviews at least three or four times a week. There is much opportunity for reflection; the material is more carefully studied and the psychoanalyst is confronted with the conflicts in a variety of ways so that he is more certain of the ground he treads. He is more certain of how much interpretation his patient can tolerate, has opportunity to present an interpretation repeatedly and to demonstrate its validity just because the same conflict presents itself repeatedly. The psychoanalyst is able to make better use of the patient-physician relationship and its distortions, better known as the transference, that are an important source of information. He has more opportunity to study his own counter-transferences and keep his own problems out of the treatment situation. He is able carefully to trace or reconstruct the development of current attitudes and modes of behavior. All of this is particularly valuable in chronic neuroses or character disorders where repeated demonstrations of the existence of conflicts are required before they are accepted. Analysis may be likened to digging up weeds in that a conflict may be defended in a number of ways and it is necessary to expose all the defenses or else new ones will develop. Psychoanalysis aims at emotional insight which is much deeper than intellectual insight.

Patients repeatedly state they know why they behave in a certain way but are unable to do anything about it. It is questionable whether such a statement is ever true because in all successful analyses it invariably happens that the patient is compelled to give up his neurotic behavior pattern when he realizes how costly such be-

havior really is in every way rather than just in a few respects. For example, the Don Juan who has been so proud of his many conquests no longer gets very much satisfaction out of them when he realizes that these are largely a display of a hostile attitude toward his mother and other women, that he needs to prove himself sexually, that he may be a cause of severe emotional disturbance in his sexual partner, and that he himself could not tolerate friendly relationships of a lasting nature.

Considering that psychotherapy is a recently developed field, tremendous strides have been made in technique. Psychiatrists are well aware of the need to shorten treatment time and to make the benefits of therapy available to more people. With an increasing number of well trained psychiatrists and continued research, a great deal more can be expected in the coming years but it is not to be hoped that psychotherapy will ever satisfy the wish for miracles that so many persons understandably entertain.

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PSYCHIATRIC EMERGENCIES*

MAX E. JOHNSON, M. D.†

NEW ORLEANS

It is my intention to discuss here some of the common psychiatric situations in which prompt and appropriate treatment is imperative for the minimizing of morbidity and mortality. In particular, I wish to consider those conditions that ordinarily fall to the lot of the general practitioner, internist, or surgeon, for care, rather than those emergencies likely to occur in a psychiatric hospital. In considering the emer-

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gency nature of a psychiatric condition we must keep before us the fact that it is not the possibility of a fatal outcome that is ordinarily the danger. The physician is usually aware of that danger and recognizes the need for prompt attention to avoid it. More important perhaps, and I believe more often insufficiently considered, is the danger, often also avoidable, to the patient's future mental and emotional health which may follow upon an acute situation. Since most of the common situations are cared for by physicians other than psychiatrists, a real contribution to mental hygiene can be made by them. This is preventive medicine.

POTENTIAL SUICIDE

When one thinks of a psychiatric emergency, the threat of suicide generally comes first to mind. While this is certainly something requiring special psychiatric handling, usually in a hospital setting, still in most instances it is the family doctor who is called upon by those around the patient when such a threat is believed to exist. The physician then must decide whether the patient is potentially suicidal or not, and if so, must be able to take appropriate action. An adequate discussion of clinical indications of the presence of an active suicidal trend in a patient lies outside the scope of this presentation. However, certain points may be emphasized briefly. Most bona fide suicidal attempts and successful suicides occur either in the course of a severe depression or in catatonic excitement. In the latter condition suicide is likely to be a sudden impulsive affair, a part of the tremendous general expression of aggressive impulses. Attacks on others may occur as well. A sufficiently depressed person kills himself with deliberate and considered purposefulness. Such a decision may be reached rather rapidly and carried out forthwith in which case no opportunity for prevention may appear. More commonly the patient broods over the matter and harbors ideas of self-destruction for a more or less considerable period of time. He may or may not apprise others of what is in his mind. It is not true that a person who

talks suicide never does it. Other clinical indications are more important. A serious suicidal intent on the part of the patient may be strongly suspected when the patient is obviously sad and depressed but not too retarded in actions, does not cry, expresses unshakable hopelessness, or speaks of suicidal ideas more or less matter of factly without seeming to be dramatic or to overdo it. Suicidal threats made in a definitely dramatic manner, evidently for effect, particularly on relatives, are apt to be gestures of a hysterical personality. These people often make actual attempts at suicide but are careful not to complete them. A patient who is extremely depressed and retarded may have insufficient drive to carry out his desire for self-destruction, so that suicide is most likely to occur as a patient is going into or coming out of a deep depression. The general physician often sees such patients complaining of various somatic dysfunctions but particularly of profound lack of energy and a feeling of being no longer able to cope with ordinary day to day activities. The general physician's important contribution to the handling of such cases is his early recognition of suicidal potentiality and his securing prompt psychiatric referral and hospitalization. While it is probably true that even in a good hospital an intelligent person bent on suicide may be able to carry it out in spite of the best supervision, certainly the danger can far more readily be coped with than in the patient's home.

INSOMNIA AND RESTLESSNESS

Insomnia and restlessness are common complaints of patients suffering from depression or chronic anxiety and tension. The symptom of insomnia would seem to require sedative and hypnotic drugs for its alleviation, and such drugs do, of course, have an important place in its treatment. The tendency, however, of the physician is to rely too exclusively on these drugs and not to exercise sufficiently close supervision over the amounts taken. The writing of prescriptions which do not contain the "non repetatur" direction will allow repeated refilling, so that the patient may

take the drug regularly long past the period desired. It is wise practice to include that direction on all sedative prescriptions and to order relatively small amounts. Only rarely is the administration of powerful hypnotics necessary for more than a few days at a time. The meaning of the foregoing remarks in regard to emergencies is that drug intoxication with possible serious consequences may develop when the use of these drugs is abused. Symptoms and signs of intoxication may appear insidiously, be at times obscured by the patient's pre-existent complaints, and may be unrecognized until a dangerous toxic state has been reached.

This picture is particularly likely to occur in bromide intoxication. The slow excretion of bromides allows a cumulative increase in blood levels so that long contained exhibition of relatively small amounts can result in toxic concentrations being reached. Bromidism may be seen following long use of certain proprietary preparations containing varying quantities of bromides. There is a typically organic type of psychotic reaction characterized by restlessness, marked confusion and disorientation, sometimes hallucinatory phenomena. A rash is often present but not in all cases. Diagnosis may be confirmed by the finding of high levels of bromide in the blood. The estimation of blood bromide concentration is probably indicated in any case of a toxic deliriod reaction having no obvious cause. The specific therapeutic measures, aside from the primary one of stopping further intake of the drug, is the administration of sodium chloride, parenterally and by mouth, to promote excretion of bromide.

More commonly used now than the bromides are the barbiturate sedatives and hypnotics. While the factor of cumulative action is not so important as with the bromides, large dosages of barbiturates are frequently given and may cause serious toxicity. Self-administration also is frequent, at times in large doses with suicidal intent, more commonly for insomnia and other manifestations of anxiety. Barbitu-

rate poisoning may appear as a chronic confusional state with drowsiness and apathy, as an acute delirium, or, when very large doses are taken, as a profound shock-like state with marked depression of the vital centers. In the last named reaction means of supporting and maintaining the function of these centers form the most important part of treatment. The use of a respirator of a positive pressure type (or manual artificial respiration) with 100 per cent oxygen is of prime importance. Picrotoxin is the central stimulant of choice. A vaso-pressor drug will usually be necessary; neosynephrin has been found to afford a more prolonged and evenly maintained increase in blood pressure with less tachycardia than adrenalin. An important point in the treatment of patients habituated to large doses of barbiturates is the inadvisability of sudden and complete withdrawal of the drug. Not only will distressing anxiety symptoms result, but not infrequently convulsions may occur when the long-standing cortical depressive influence is suddenly removed. A more gradual decrease in amounts and frequency of dosage with substitution of another barbiturate for the one habitually used will avoid these complications.

DELIRIA

Deliria in the course of severe systemic diseases are not uncommon and require prompt handling both because of the dangers inherent in the delirious state and the deleterious effect on the treatment of the primary condition. General measures indicated in the treatment of any acute delirium regardless of underlying cause may be detailed here. The patient should be subjected to as little in the way of changing environmental stimuli as possible; therefore, a quiet room is advisable, and lighting should not be bright or conducive to shifting shadows which may be frightening. Nurses and attendants should be few and not changed frequently. Fluid intake must be maintained, parenterally if necessary, with added vitamins and tonic doses of insulin. There is in all cases the possible danger of death from exhaustion or at times sudden unexpected death in an acute toxic delirium.

A special, and exceedingly common, cause of toxic states and deliria needing early and adequate treatment is of course alcohol. The danger to life in delirium tremens is sufficiently well attested by the too frequent reports of sudden deaths among alcoholics in jails or elsewhere. Much more common but more important from the viewpoint of prevention are the less severe grades of alcoholic disturbance. These conditions are the precursors of delirium tremens into which they may develop unless properly handled, which almost always can be done. Nearly every physician will at some time be called upon to treat such a situation, and I believe that such care is in the domain of the general physician rather than that of the psychiatrist. In any event psychiatric treatment and especially psychotherapy of such a case must await the control of the toxic condition; nothing can be attempted in the way of treatment of the underlying alcoholism until then. These cases may if necessary be satisfactorily treated in the home although usually treatment in a general hospital may be advisable. The more severe instances of course may have to be sent to a psychiatric unit or hospital. A simple and easily administered detoxifying regime has proved to be very effective in the usual case. In 50 c.c. of 50 per cent glucose is placed 20 units of regular insulin and 100 mg. of thiamin chloride, the whole being given intravenously every four to six hours over a period of one to three days. In the home or in milder cases generally sugar in fruit juice and thiamine orally may be substituted with efficacy. The patient is to be encouraged to eat and ordinarily will begin to do so under the stimulus of these procedures. The complete withdrawal of alcohol is probably neither necessary nor advisable. The patient is more likely to cooperate in treatment if an occasional small drink is provided or if he is given to believe that he may have a drink if he feels an imperative need for it. The mere knowledge that a drink can be had may enable the patient to do without it. Dexedrine (dextro-amphetamine) in 2.5 to 5 mg. doses

two or three times in the forenoon may aid in restoration of energy and improvement in mood. In the presence of much restlessness some sedation may be necessary. Chloral hydrate is often quite effective; the judicious use of barbiturates such as secobarbital is not contraindicated.

ACUTE ANXIETY STATES

I should like to touch briefly upon a group of situations the emergency aspect of which will be less apparent. Every psychiatrist is familiar with acute anxiety states, amounting at times to panic reactions which may be the response to a more or less sudden activation of emotional conflict by internal or external influences. Often enough such a state is the precursor of a severe and acute psychosis of a schizophrenic type, a catatonic excitement. In some instances this serious development may, I believe, be obviated by proper handling of the preliminary reaction. The patient may consult his physician ostensibly because of rather obvious somatic expressions of anxiety; the "jitters," palpitation, giddiness, headache, etc., and may have difficulty telling the doctor about his real fears—of psychosis, of losing the mind, and behind that, often enough, concerns about homosexuality. Not that these patients are overtly homosexual; rather some occurrence, perhaps an actual seductive approach by a homosexual, has mobilized latent conflicts concerning such impulses and aroused in the patient fears of possessing such inclinations. The busy physician may be tempted to pass off the patient's complaints rather lightly and send him away with a prescription for phenobarbital and the admonition to "forget it." Unfortunately he may be able to "forget it" only by becoming psychotic. This eventuality of course many times cannot be prevented even by expert psychiatric attention. But in many instances the general physician may be of real help to such a patient at the cost of only a moderate amount of time and interest. The experience of talking about these carefully hidden fears to a calm and sympathetic listener is therapeutic. The physician may reassure

the patient about the unreality of his worries and point out the normality of his impulses. A little expenditure of time may make the difference between mental health and illness.

SUMMARY

A few of the emergencies of a psychiatric nature which the general physician may often see have been discussed. The importance of early recognition of delirious states, the avoidance of over-use of sedative drugs, and the possibility of preventing psychotic reactions have been stressed.

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DISCUSSION

Dr. C. S. Holbrook (New Orleans): Dr. Johnson has brought us a presentation in which most of the common emergencies we see in psychiatry are brought out. I can only emphasize some of the things he has said. Suicide, of course, is the real danger when the patient is depressed, and if it occurs, the family and the physician will have a feeling of guilt, and possibly justly so. Suicides should be preventable, but in some instances they are not, for the person who intends to commit suicide may outwit everyone who is trying to prevent it, even in well regulated hospitals. That is not as true today as formerly. Today with modern treatment, with use of electroshock treatment, these patients do not have to go through prolonged periods in which they are harboring ideas of suicide. These suicidal intentions can be eliminated in the course of two or three days. If a patient who is suicidal is admitted the thing to do is to give electroshock treatments frequently, an intensive treatment, maybe two treatments a day, or even three a day. In that way within two or three days the danger is over, at least largely so. All definitely suicidal patients should be placed in hospitals where they can be properly treated. These patients with depressions formerly would be sick for three, six, nine, eighteen months, but today almost all of them can be cured or restored within four to six weeks, thus protecting them against the danger of suicide, and that is one of the things we can do for suicides. Many patients may not talk about suicide as such, but they tell you they feel like a failure, the family would be better off without them, that their whole life is worthless, and such expressions as that should make one realize they are contemplating suicide. The patients frequently do not come in saying they are

blue, they say other things, inability to work, fatigue, peculiar feelings in the head, and lack of getting any satisfaction out of life. Often one has to ask them a direct question, if they are sad, or if they are happy, then the whole story comes out, they are depressed and melancholy. They frequently commit suicide without saying they intend to do so.

Dr. Johnson spoke of bromides and I wish to emphasize that. I find no need to prescribe bromide except once or twice a year and then only for brief periods. I know they are dangerous drugs to put in the hands of a patient; there are better sedatives than bromides. Often doctors will give a patient a prescription containing bromide and he is told to take it every three or four hours, then he phones back to say the medicine is out and the doctor tells him to have it renewed. Then the patient learns to have it renewed. Bromide is accumulated in the body, is not excreted as fast as it is taken in and this induces a toxic state which may cloud the underlying condition for which the bromide was given. If I had my way I would eliminate bromides completely from the pharmacopoea.

In the talk on alcohol, I find it is almost impossible to treat any of the bad cases of alcoholism without placing them in a hospital and frequently the general hospital is not suitable because the patient can leave if he wants to. Occasionally if you put one of those short hospital gowns on the patient and take away his other clothes, he is pretty well stymied. But he might even then wrap a sheet around himself and try to get to the closest bar. I never try to treat alcoholics at home for usually it is a waste of time. In ninety-nine cases out of a hundred, the patient has learned ways of getting around the family through practice extending over many years and there is no way to keep him from continuing to do this. It just does not work.

I withdraw alcohol completely and abruptly. I think it has a good psychological effect. When a patient comes to the hospital for treatment I tell him we can substitute something for alcohol and drinks will not be necessary. If you give small doses of alcohol for a few days it is harder to stop it. So I stop it when the patient is admitted to the hospital.

There is another emergency Dr. Johnson did not mention that I would like to say something about, and that is the patient who is markedly excited, the patient who cannot be controlled, who is breaking up the furniture, a danger to himself and everyone else. Often such a patient will not take medicine by mouth and some other form of medical control has to be devised. Bromides are too mild and too slow acting. I rely upon the use of morphine and scopolamine hypodermically. Morphine by itself will not have the desired effect, but

$\frac{1}{4}$ gr. of morphine and 1/100 gr. of scopolamine will quiet practically any excited patient. After that plans can be made for hospital care and the regular administration of other drugs. Intravenous amytal sodium will be almost as satisfactory if you can keep the patient still enough to get the needle into the vein and give the drug slowly. Frequently you cannot do that because the patient is struggling and fighting.

ELECTROSHOCK THERAPY*

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Electroshock therapy is the generally accepted type of therapy, with its limitations, now used in the treatment of manic depressive psychosis, all types of psychotic depressions, and certain cases of schizophrenia, by most private psychiatrists and in most of the better state hospitals throughout the world. This type of therapy has definitely shortened the stay of the patient in a mental hospital. I have given electroshock therapy to an average of 50 patients, continuously, twice a week, for the past seven years, from December 1, 1940, to date. The following eight points are excerpts from GAP's article on psychiatric treatment† with which I heartily agree:

1) There is as yet no adequate theory on the mode of action of electroshock therapy. All indications are that it acts on a symptomatic, rather than on an etiological level.

2) The preponderance of evidence points to the conclusion that electroshock therapy materially shortens the majority of depressive episodes, particularly those that occur in the involutional period. It often aids in shortening manic episodes.

3) The evidence is conflicting as to the efficacy of electroshock in schizophrenia. Good results have been reported in some cases of severe catatonia and in some acute paranoid reactions.

* Read at the meeting of the Sixth District Medical Society (Louisiana) at the East Louisiana State Hospital, Jackson, Louisiana, November 7, 1947.

† Bulletin published by Group for the Advancement of Psychiatry, Topeka, Kansas, dated September 15, 1947.

4) Use of electroshock therapy is contraindicated in the psychoneuroses, with the possible exception of a reactive depression.

5) The complications and hazards of the use of electroshock therapy should be re-emphasized, since they have been minimized by some workers.

6) The therapy should be given by psychiatrists only, and they should be well trained in the technic of its administration. It should be considered only as an addition to the total psychiatric treatment program.

7) The therapy should be given only to hospitalized patients, and never to private office patients.

8) Active research is still indicated, considering:

(a) The establishment of uniform criteria for evaluation of results of this type of therapy.

(b) Combined psychological and psychodynamic studies, which would lead to a better understanding of the patient.

(c) Adequate, long time follow-up studies, which would lead to a better evaluation of the patient's clinical status during a remission or after an apparent recovery.

To understand this type of therapy properly, a few words are now in order as to the cause of a psychosis. In plain words, other than lues, we just do not know. We cannot, therefore, consider electroshock therapy a true cure. In the psychotic patient, we know that there is, or has been, a reaction to the environment. Something happens to upset the patient's nervous system. He does not care to discuss this with anyone, so buries the conflict in his heart and begins to worry about it. The mental upset, brought about by the worry, plus some as yet unknown factor (possibly hereditary in nature) brings about the psychosis.

The electroshock produces a convulsion. Following it, there is a state of mental confusion, which varies in length, depending on the individual patient, from a relatively short time to several hours. The patient cannot worry about the reaction to his environment, whatever it may be, during the period of mental confusion. The therapy

is repeated a number of times, with the hope that the patient's problems will get dimmer and dimmer in his memory and that he will eventually forget them, and, as a result, will be restored or at least improved mentally. At this hospital, we give a minimum of eight or ten treatments and a maximum of twenty-five, consecutively.

After receiving the maximum number of consecutive treatments, the patient is given a rest period of about six weeks. If we then feel he needs more treatment, another series is started. Here, we never give up a case as unimprovable until the patient has had at least seventy-five treatments, or three complete courses. We give treatments twice a week. From January 1 to October 1, 1947, I have completed the therapy on 197 patients. Of these, 125, or 68.59 per cent, are at home on furlough at this time. We do not have a large enough social service department to do any follow-up work on furloughed patients, so I do not know how all of these 125 patients are adjusting away from the hospital. I do receive gratifying reports, occasionally, from some of these patients' relatives.

There are certain potential dangers from the electroshock treatment. As previously stated, it causes the patient to have a convulsion, and, during it, it is possible, though improbable, for the patient to sustain a fracture. The usual site of injury is a compression fracture of the dorsal spine. A few deaths have been reported, but these have occurred when serious complications follow the administration of electroshock therapy. As far as is known to the writer, there have been no fatalities as a direct result of the use of the electroshock therapy.

Because of the potential dangers, we, at the East Louisiana State Hospital, have required the written permission of the nearest of kin before the therapy is administered to any patient. In the immediate past, however, the Superintendent has given the writer his verbal permission to administer the therapy to any patient whom he considers a fit candidate, physically as well as mentally, with or without the written permission of the family. It is my un-

derstanding that a written permit is not required by many psychiatrists in private practice. From my point of view, it is really not necessary, for, as stated above, the electroshock therapy is the accepted method of treatment for various types of psychoses. Personally, I have not had a death as a direct result of the therapy, and the total number of broken bones is nine. Of these, seven were compression fractures of the dorsal spine, one was a fracture of the clavicle, and the ninth a chip fracture of the head of the femur.

Now, regarding the therapy itself: At this hospital, no food or drink is given the patient for about two hours, preceding the treatment, to lessen the possibility of aspiration pneumonia. The patient lies on his back, on a wooden table, with a pillow under the lumbar spine. A cloth gag is placed in the patient's mouth and the jaws are held together by a nurse. She also holds the patient's left shoulder and does not allow it to move about freely during the convulsion. An attendant holds the patient's left hand and left hip, another his feet, a third one holds his right hand and right hip and a fourth his right shoulder. Electrode jelly (one tube of KY jelly and one teaspoonful of salt) is applied to the patient's temples. The electrodes are placed on the patient's temples, and held with a rubber band. The machine is connected to the electrodes and the treatment is given.

The modern electroshock machines are so constructed that an overdose of electricity is practically impossible. The voltage can be controlled by turning a knob on the machine, from zero to the voltage on the line at the time the treatment is given. The newest machines have a booster unit on them, which will raise the voltage twenty-five volts over that on the line. The duration of the shock can also be controlled by turning a knob on the machine, from one-tenth of a second to one second. When the proper time and the proper voltage are reached (this varies with each patient), the patient immediately has the convulsion. This lasts a minute, or less, and the patient then often sleeps for about fifteen minutes

and awakens mentally confused. We start the therapy, at this hospital, generally, at 110 volts for six-tenths of a second, and give a double shock, for we have found that this will usually produce the desired convulsion. If it fails, the voltage is raised to 120, and a second attempt is made the same day. If no convulsion occurs after the second trial, nothing more is done until the day the therapy is administered again, when the first attempt is 120 volts for six-tenths of a second. As soon as the convulsion is over, the pillow is removed from the lumbar spine area and is placed under the patient's head. When the respiration has started again, the patient is moved to a bed, on a rolling stretcher, and the next patient is brought to the table. With our system, I administer treatment to 50 patients in approximately two hours.

Another type of therapy, electro-narcosis, is now coming into use in many places. This is a longer shock, but with a lower voltage, and encouraging results are being reported from its use. This type of electroshock therapy may soon be used in this hospital.

DISCUSSION

Dr. C. S. Holbrook (New Orleans): I am indeed glad to discuss the splendid work that Dr. Sturm and other members of the medical staff are doing in the East Louisiana State Hospital. That institution always begets fond memories for me, for it was there I received my early training in psychiatry.

The presentation tonight well illustrates the modern methods that are used to restore patients and greatly shorten their hospitalization. True, all psychotic patients are not benefitted by electroshock therapy, as exemplified in the organic psychoses such as paresis, cerebral arteriosclerosis, and senility.

In New Orleans we have been using electroshock, or, as I prefer to call it, "electric-sleep," treatment since 1941. The group of us who practice at the DePaul Sanitarium, New Orleans, have administered 27,778 treatments to 3,831 patients; at Touro Infirmary I have given 8,347 treatments to 1,571 patients. There have been no deaths, and few serious complications as a result of the treatments.

Recently I studied 200 depressed patients who were treated at the DePaul Sanitarium before the advent of electro-sleep therapy, and it was found that many of these patients remained hospitalized six, twelve, eighteen months or more; the average

stay was one hundred and twenty six days. Another group of 200 depressed patients, treated within the past six years with electro-sleep therapy, was compared with the previous group, and except for the employment of electro-sleep therapy these patients received essentially the same care and treatment. In this last group practically all the patients were restored within two months, and more than one half of that number were restored within thirty days. The average hospital stay was thirty-eight days as compared with one hundred and twenty-six days for patients treated without the benefit of electro-sleep therapy.

Another study was made of manic patients, and the results paralleled those of the depressed group.

With this modern therapy in properly selected patients, hospitalization time can be reduced by two-thirds or more, thus permitting a great hospital like this to treat many more patients in a given time because the duration of the psychosis could be markedly shortened.

In the less severe depressions, many individuals can be treated as out-patients. At Touro Infirmary, about 90 per cent of the patients receiving electro-sleep therapy treatment do not stay in the hospital but report there for treatment 2 or 3 times a week. They are admitted at 8 A.M., receive their treatment, and are able to leave by 9:30 or 10 o'clock. In the afternoon and evening, many are able to do their housework or go to picture shows, etc.

Dr. Sturm and the staff of the East Louisiana State Hospital are doing most creditable work, and I want to congratulate them and the Superintendent, Dr. Glenn Smith, who by his encouragement and cooperation has made all this possible.

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GENETICS AND CANCER*

WALTER J. BURDETTE, Ph. D., M. D.†

NEW ORLEANS

Among the unsolved problems in medicine, that of the etiology of cancer is one which remains most obscure, and the facts which have been learned about it bring forth new questions which are unanswered in addition to leaving the original problem only partially solved. In spite of prodigious effort, the patient with cancer can be offered much less than is desirable. Many feel that the real hope is to be found in

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fundamental research in oncology and that advances in treatment will follow additional knowledge so obtained. There is one phase of this approach toward which we would direct your attention. It is a consideration of the part heredity plays in initiating cancer.

GENERAL CONSIDERATIONS

Several questions present themselves when the genetic basis of susceptibility and resistance to cancer is considered. Do genes play a part in the appearance of cancer? Are one or more genes involved? Are the same hereditary factors involved in all types of cancer? What is their distribution on the chromosomes? Must the same gene be present on one or both chromosomes in each pair to be effective? How are the gene and its expression affected by changing the environment? These questions may be answered in part.

Before the genetic background of cancer development can be understood properly, it is essential that one knows how the units in heredity, the genes, are expressed. It is well known that the visible expression of a gene, the phenotype, depends on the conditions existing during the period of gene action. The effects of a gene may vary with environmental conditions, but the gene itself passes from generation to generation in unchanged form. It follows then that the end result of gene action in an organism does not necessarily indicate the presence or absence of the gene on a chromosome. Applying this to cancer, we must study susceptibility to cancer and not regard the presence or absence of cancer as necessarily indicating the presence or absence of these genetic factors for susceptibility. A consideration of the effect rather than the genes for susceptibility themselves led to erroneous interpretation of Slye's data²¹ on cancer in mice.

There are many instances of familial incidence of cancer in man, but the most convincing data that there is an hereditary background are found in studies on other forms, particularly mice. This is in large part due to the heterogeneous nature of the

human population and obvious lack of proper control in an experimental sense. By inbreeding, it has been possible to produce strains of mice which are remarkably uniform in their susceptibility to certain specific neoplasms appearing spontaneously and induced. These stocks are the most uniform mammalian population yet produced, and until these strains were established by brother-to-sister matings through a single line for many generations, progress in the experimental study of cancer was retarded. After they became available, advancement in our understanding of the origin of neoplasms was more rapid, and this application of genetics has generally been credited as a significant step forward. Experiments designed to yield information about the chain of events leading up to the neoplastic change have been most fruitful.

TUMORS INDUCED BY SUBCUTANEOUS INJECTION

OF CARCINOGEN

In order to show how genetic factors for susceptibility operate, let us first examine one example^{5, 6, 7} in detail and then compare these results with those for other types of tumors. The case of induced, subcutaneous tumors in mice is representative in some of its aspects and unique in others. Induced tumors were studied because they appear earlier and much more frequently than spontaneous tumors of the same type.

The method of study used was to inject each mouse at sixty days with 1.0 mg. of 20-methylcholanthrene, a carcinogenic hydrocarbon. The needle was introduced subcutaneously. The animals were given a uniform diet and maintained in air-conditioned quarters. The time of appearance and nature of the tumors were noted.

The incidence of tumors was studied first in a number of inbred strains. Tumors appeared at the site of inoculation, and microscopic examination of the tumors showed neoplasms of four primary types. They were spindle cell sarcomas and rhabdomyosarcomas chiefly. Epidermoid carcinomas and anaplastic tumors were found occasionally. In addition two or three of these elements were present in the same section at times. The tumors were malignant and autonomous as demonstrated by transplan-

tation experiments. Also autopsy showed invasion of the body wall.

It is clear that there are differences in the susceptibility of the groups, since environmental conditions were held relatively constant. In general a larger total number of animals have tumors if the time of tumor appearance is earlier. It is important to know that even if an animal does not develop a cancer, its offspring have tumors in a percentage of cases characteristic for that stock. Further proof that heredity plays a role is that the susceptibility of the more closely related strains is similar.

By mating mice of the most susceptible to those of the most resistant strain, the nature of the inherited factors for susceptibility is made clearer. If a completely dominant factor for susceptibility were present, one would expect all of the offspring to develop cancer in the same manner as the most susceptible, C₃H strain. If a single, completely recessive factor were present, the offspring should have the same incidence of tumors as the most resistant, JK strain. It is evident from the data that neither of these possible conditions is present. This intermediate type of inheritance is known to exist for other inherited characters besides susceptibility to cancer and may best be explained by the presence of multiple genes. That is, a number of genes contribute to the total effective susceptibility but each not necessarily to the same degree. Matings result in offspring with intermediate expression of the character. It is probable then that multiple genes determine susceptibility to these tumors which have been described.

There was no difference in susceptibility between males and females. When the reciprocal cross was made the offspring of the more susceptible females had no greater tendency to develop tumors than those of the more resistant females. It was this type of cross which led to the discovery of the milk agent in mammary cancer in mice. There is no evidence that such a substance plays a role in the origin of the tumors under discussion.

It is possible to find whether genes for

susceptibility are present on chromosomes known to carry other genes unrelated to cancer. The JK mice bear four mutant genes, *pink eye*, *short ear*, *non-agouti*, and *brown*. If animals showing any of these recessive characters in the backcross generation are more resistant than those with the normal allele, genes for relative susceptibility to cancer reside on that chromosome. However, this was not the case and therefore there is no evidence that the genes involved in the inheritance of cancer are present on these four chromosomes. Results in other laboratories on different types of tumors indicate that genes for susceptibility are present on the chromosomes carrying *brown* and *non-agouti* and the X-chromosome, so it is possible to say that identical genes are not involved in susceptibility to all types of cancer.

From these studies we may conclude that susceptibility to tumors induced with methylcholanthrene is hereditary in certain strains of mice. The differences found are in appearance time of the tumors, survival time of mice developing tumors, and the predominant type of tumor. Survival time does not necessarily parallel susceptibility as judged by the appearance time of induced tumors. There is no evidence that a milk agent affects the appearance of the neoplasms. Susceptibility to cancer in the mice studied is due to multiple genes which are present on chromosomes other than the sex chromosomes or chromosomes 1, 2, 5, or 8.

OTHER TYPES OF CANCER IN ANIMALS

By similar methods other types of inheritable cancer have been studied in mice. It should be interesting to compare the results reported above and those obtained in other types of cancer by other investigators. Perusal of the literature yields abundant evidence that genes for cancer susceptibility are linked to definite chromosomes. Melanotic tumors in insects and fish⁸ appear when certain genes are present. It is interesting that even in so simple a form as the fruit fly the situation is complex, and several genes on different chromosomes are involved.^{9, 20, 22} *Neurospora* was selected by Beadle, Tatum,² and others to study gene

action in a relatively simple organism. They have found a one-to-one relationship between mutant genes and the chemical reaction selected for study. It is interesting that some of the same agents which are effective as incitors of cancer also cause mutations¹ in *Neurospora*, *Drosophila*, and possibly mice.

Heston¹⁰ believes that susceptibility to pulmonary tumors in mice is due to multiple factors, and he has located and identified them on two chromosomes and ruled out several other chromosomes as the location of others. He also found susceptibility increased by the lethal yellow gene which may be associated with increased body size in these animals.¹¹ Little¹⁷ found that yellow mice had a lower incidence of mammary cancer than non-yellow mice in crosses between susceptible dilute brown mice and resistant yellow mice. Bittner⁴ decided that multiple factors are responsible for susceptibility to mammary cancer and concluded that one may be linked to the chromosome bearing brown in studies on C₅₇ and A mice.

In breeding experiments it was found that the offspring of females from a strain with high incidence of mammary cancer had approximately as many tumors as the parental females, even when the male parent was of a strain in which few of these tumors appeared. However, when the reciprocal cross was made, the incidence in the F₁ was much lower. That is, when the female parent was from the resistant strain and presumably the male of the susceptible strain introduced only chromatin into the F₁. This difference was attributed to an extrachromosomal factor by Little and co-workers¹⁴ and Kortweg.¹⁶ By means of foster-nursing experiments, Bittner³ was able to show that it resided in the mother's milk. The presence of milk agent, however, does not eliminate heredity as being operative in cancer genesis, and there is evidence to show that even the milk agent is influenced by genetic factors. Mice may develop mammary carcinoma after the milk agent has been eliminated. A third thing which is known to influence the appearance of mammary cancer is the hormonal mechan-

ism and accounts for differences in incidence of this cancer in males and females. Thus several mechanisms play a role in the origin of mammary cancer in mice, and hereditary factors are probably effective in two ways, primarily on the organism and also secondarily through their effect on the hormonal and milk factors.¹²

Cancer of the stomach has been induced in mice with carcinogens. The forestomach is lined with squamous epithelium and tumors appearing there have no similarity to carcinoma of the stomach in man, but adenocarcinomas also appear. Strong²³ has developed a strain which develops adenocarcinoma of the stomach spontaneously and has reported that it is due to an inherited factor on the chromosome bearing the gene for brown coat color. This NHO strain was formed by serial administration of carcinogen to mice of successive generations not highly inbred originally. Animals resistant to subcutaneous tumors were selected, and eventually in one subline adenocarcinoma of the stomach began appearing in a predictable fashion without the injection of carcinogen.

Spontaneous leukemia appears in many animals and has been studied most extensively in fowls and mice. Myelogenous leukemia and erythroleukemia are transmissible by a virus in fowls. All forms of leukemia occurring in man are also found in mice except for plasma cell leukemia. Inbred strains of mice such as the C₅₈ strain of Richter and MacDowell¹⁹ have been produced and shown to develop leukemia in a characteristic percentage of the animals. Most of the animals developing the disease have the lymphogenous form. Studies on the inheritance of leukemia show that in strains where leukemia occurs, even those not having leukemia have a characteristic number of offspring with the disease. Multiple genetic factors may account for susceptibility to the disease. There is good evidence that a maternal non-chromosomal factor has an influence in its development, but this agent is not carried in the milk. No difference in sex incidence is present. The incidence of leukemia is increased and man-

ifestations accelerated by carcinogens, estrogens, and x-rays. However, mice developing leukemia are not susceptible to all agents to the same degree and may be resistant to one and susceptible to other leukemogenic treatments.¹⁵

GENETICS AND CLINICAL CANCER

Transferring conclusions reached from studies on other species to man must always be critically and carefully considered. There is enough suggestive evidence that hereditary factors are important in the occurrence of human cancer, however, to indicate that basically a similar situation may exist in both. Characteristic racial incidence of cancer at the various sites is well known. For example, Iguchi¹³ reports a relatively low incidence of mammary cancer in Japanese women. The Norwegian Cancer Committee collected 6,000 cases of cancer and interviewed the relatives.²⁴ They found the incidence of cancer higher among sisters than wives of the patients with cancer. If one parent had cancer, more than twice as many of the siblings had cancer as when neither parent was affected. Doubtless retinoblastoma is an inherited disease at times, usually appearing in successive generations.²⁵ Additional evidence of an inherent susceptibility is the bilateral distribution in 20 per cent of those affected. Neurofibromatosis appears in families and in many is inherited in the manner of a dominant character. Rectal polyps often undergo a malignant transformation, and very striking family histories have been published by Lockhart-Mummery and Dukes¹⁸ showing that multiple polyposis is inherited in a dominant fashion. One example given is a set of twins who developed symptoms at 30 years and both died at the age of 41, one from intestinal cancer and the other as a result of colectomy for adenomatosis.

Anyone familiar with Rh blood grouping will agree that it is not necessary to defend the importance of heredity in the management of some diseases. Although at the present time it is not possible to state exactly how genes operate in the etiology of cancer, knowledge that they play some part should be utilized. There are several ways in which this can be done. If a patient has

a neoplastic disease known to have a high familial incidence, his physician should inform him so that he may decide about questions of marriage and having children with that in mind. The relatives (children, siblings, and parents) of patients found to have polyposis of the colon, or carcinoma of the colon appearing as a later manifestation of that disease, should have sigmoidoscopy and barium enema performed at least. Where there is any doubt in the clinician's mind as to whether further diagnostic procedures should be done in a given case, a suggestive family history of cancer should be taken into consideration. For these reasons a family history is an important part of any patient's record and should be taken carefully. There is no conclusive evidence that a milk agent for cancer is present in human milk. Pertinent data should be included in the history for future reference, but artificial feeding is hardly indicated as a measure to prevent breast cancer at the present time. With this brief discussion of one phase of our knowledge of the cause of cancer, it should be evident that there are a number of avenues of approach to the problem which should allay in part the usual pessimism which pervades this field.

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HEALTH UNITS FOR LOUISIANA

WALDO L. TREUTING, M. D., M. P. H.†
NEW ORLEANS

The health of the people has always been the responsibility of the physician. His is the responsibility both for the prevention of illness and for treatment should illness develop. The growth of population and accumulation of people into larger communities has brought with it different and more complex problems in prevention. The safeguarding of their health has become less a personal problem and more and more of a community responsibility; thus, the devel-

opment of Public Health as a governmental function as well as a branch of medical practice. The public health physician is concerned with the health of communities and the broader aspects of disease, morbidity and mortality rates, and environmental protective measures. His specialty requires the cooperation of the sanitary engineer, the public health nurse, the statistician, the epidemiologist, and other technically trained personnel, and above all the spirit of the missionary.

The modern public health movement was founded upon the discoveries of the last six decades in the field of bacteriology. With the discovery of the etiological agents of many of the infectious diseases and their mode of spread, it became possible to institute preventive measures, such as water purification, sanitation, and food protection. It ushered in a new era in preventive medicine as well as in curative medicine.

During the past few years there has been remarkable progress in the field of preventive medicine as well as in curative medicine. There has also been an awakening of community consciousness and interest in the broader phases of prevention and control of disease. This movement has been led by the physicians individually and through their organizations, both state and national. Physicians in private practice are working more closely than ever in cooperation with community leaders and public health personnel to give to the people the greatest benefits ever known in the preservation of health and well-being.

NATIONAL HEALTH PROGRAM OF THE A.M.A.

Perhaps the greatest stimulus of all in this direction has been the National Health Program of the American Medical Association which was adopted and promulgated by the Board of Trustees and the Council on Medical Service in February of 1946. Since our topic has to do with adequate health services especially through Parish Health Units, it is pertinent to quote from Point Number Two of this ten point program: "The provision of *Preventive Medical Services* through professionally competent health departments with sufficient

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staff and equipment to meet community needs is recognized as essential in a health program. The principle of federal aid through provision of funds or personnel is recognized with the understanding that local areas shall control their own agencies as has been established in the field of education. Health departments should not assume the care of the sick as a function, since administration of medical care under such auspices tends to deterioration in the quality of the service rendered. Medical care to those unable to provide for themselves is best administered by local and private agencies with the aid of public funds when needed." Coincident with the development of this program and following it, state and local medical societies have planned for the strengthening and expansion of health programs in their respective areas.

LOCAL HEALTH UNITS FOR THE NATION

Public Health administrators the nation over have been interested in more efficient organization of their departments and their services. The acknowledged shortage of professional personnel including those trained in public health and the increasing cost of services have made planning for efficient organization necessary, if expansion is to proceed along rational lines. A most extensive study on this subject was made by a committee of the American Public Health Association. This study has been reported in an exhaustive report entitled "Local Health Units for the Nation." This report has been revised in some respects since it first appeared and stands as the most comprehensive appraisal of health organization and standards for personnel extant. It has been the stimulant and the model for state planning since its appearance.

The report develops the principle that for efficient service, health units should be organized not solely on the basis of political subdivisions but on population groups of a size that can support such an organization. A population of fifty thousand has been set as the smallest able to support an adequate health service. The

cost of maintaining an adequate service would be too great for a smaller group and in most instances could not be afforded. It is estimated now that adequate local health service, based on the standards for personnel set up in the report, costs approximately \$1.50 per capita per year. For an area with less than fifty thousand population the per capita cost would be greater so it is recommended that parishes (counties) be grouped where necessary into health districts with a population large enough to support an adequate service.

The report recommends certain standards for personnel on the basis of population. It is considered that adequate local health service can be rendered by one public health physician for each fifty thousand population, one public health nurse for each five thousand population, one sanitarian for each fifteen thousand population, and sufficient clerical personnel to handle the work of this staff, or one clerk for approximately each twelve thousand population. Thus for an area of fifty thousand population the staff would consist of one physician, director of the unit, ten public health nurses, three sanitarians and four or five clerks. These ratios would of course vary to some extent with the area served and its problems and programs. Certain areas may require a larger staff of sanitarians. Such would be true of an area with a large food processing industry. Also an area with a smaller population than fifty thousand may be more efficiently operated as a unit with a full time public health physician than if it were combined with another area just to bring the total population to the suggested minimum. No standard can be strictly adhered to but must be adjusted to suit the conditions of the particular area concerned.

THE ROLE OF THE PUBLIC HEALTH PHYSICIAN

We must recognize the fact that the public health physician is essentially a medical administrator with a thorough knowledge of the mass phenomena of disease prevention and health promotion. He need not often himself be a specialist in pediatrics or obstetrics, vital statistics, or even in epidemiology. He is first of all a specialist

in public health, but remains largely a general practitioner of public health.

Like any good administrator, the physician in public health must have a full knowledge of what the specialties and specialists in medicine can contribute to his objectives. He will need part-time or even full time specialist-physicians on his staff. But the medical director of an industry need not necessarily be a surgeon, or even an internist. He does need to know how to select good surgeons, and what to expect of them. The health officer, if he is a good administrator, must know how to select specialists as needed. Of prime importance is his knowledge of what to expect of them and how to provide a congenial working environment which will offer them the satisfaction they seek and make their services most valuable to the public.

No one but the public health administrator himself can provide complete knowledge of, and give constant attention to, the health problems of large groups of the population; the most effective methods of improving their mental and physical health; the dangers of their environment and methods of mitigating those dangers; effective methods of presenting his needs to the public and to fiscal officers; and the science and art of personnel administration.

These necessary knowledges and skills are acquired through special training and experience just as are those needed by the specialist in other fields of medicine. The public health physician must be considered as one of the team of medical practice which as a whole is responsible for health for all.

PROPOSED PUBLIC HEALTH ADMINISTRATION IN LOUISIANA

In planning for public health administration in Louisiana, it is considered that local units of jurisdiction should include a sufficiently large population to support and to justify a staff of full-time, professionally trained persons. Accordingly, to provide for the efficient use of personnel, it would be desirable to decrease the number of local health units in the State by the formation of health districts in lieu of certain individual parish health units. Legislative author-

ity for such health districts already exists in Act 79 of 1921 as amended and Act 246 of 1942, the Local Service Act.

The combination of parishes into districts which has grown out of this planning is shown in Table I. In preparing this plan consideration was given to various factors, including population characteristics, distribution of population within the parishes, and accessibility of the parishes to each other over the existing highway system.

The proposed arrangement should be considered tentative. In the development of the program consideration will, of course, be given to the views of the local agencies which contribute funds and support to the local health units.

TABLE I
A PLAN FOR DISTRICTING LOUISIANA
FOR THE
ADMINISTRATION OF PUBLIC HEALTH
SERVICES

DISTRICT NUMBER	PARISHES	ESTIMATED POPULATION
1	Caddo	141,572
2	Bossier, Webster	65,011
3	Claiborne, Bienville	40,432
4	Lincoln, Union, Jackson	49,176
5	Ouachita, Morehouse, Caldwell	94,501
6	East Carroll, West Carroll	29,707
7	Richland, Franklin	50,501
8	Madison, Tensas	26,382
9	DeSoto, Sabine	42,600
10	Natchitoches, Red River	46,294
11	Winn, Grant	29,076
12	LaSalle, Catahoula, Concordia	36,926
13	Vernon, Beauregard	50,495
14	Rapides, Avoyelles	139,023
15	Calcasieu, Cameron	97,225
16	Jefferson Davis, Allen	40,030
17	Evangeline, St. Landry	100,277
18	Acadia, Vermilion	85,081
19	Point Coupee, W. Baton Rouge, Iberville	53,601
20	E. Baton Rouge, E. Feliciana, W. Feliciana	144,382
21	St. Helena, Livingston, Tangipahoa	64,850
22	Ascension, St. Charles, St. James, St. John	57,527
23	Washington, St. Tammany	57,689
24	Jefferson, Plaquemines, St. Bernard	96,107
25	Orleans	609,575

It is considered that the proposed organi-

zation would provide an efficient and effective administrative program for the present; and will provide also a program for orderly progression and advancement of personnel of various kinds in the health services of the state.

FINANCIAL SUPPORT OF LOCAL HEALTH UNITS

An important part of the planning has been the matter of financial support of local health units and distribution of State and Federal funds. Under the American form of government sovereignty is vested in the State. State agencies and local governmental units get their authority to exist and to function by delegation of authority and power from the State, as provided in the State Constitution and in Acts of the Legislature. Public health administration is but one of many governmental functions, and local units of government in Louisiana by the Constitution and by legislative act have both the authority for local health administration and the responsibility of supporting this function.

Public health administration is based upon, and is an exercise of "Police Power," an inherent attribute of sovereignty. Delegation of authority by the State to local units of government does not divest the State of its authority, or relieve it of its responsibility to protect its citizens. The complex, frequent, and close contacts incident to present conditions make it difficult, and in fact impracticable, to define exactly and to delimit precisely all matters of strictly and purely local sanitation, not affecting other portions of the state. Therefore, the State should give assistance, including financial assistance, to local boards

of health; and in the event of failure, refusal or inability of local agencies to provide protection, the State is obligated to provide at least a reasonable degree of protection commensurate with its financial ability and local needs.

The State has for many years been giving assistance to parishes for the organization and maintenance of health services. There has, however, been no set procedure for the allocation of State and Federal funds, so that all parishes have not shared equitably in this assistance. It is proposed that a formula be developed for this purpose and such is under study at the present time. In developing such a formula consideration is being given to a *basic local appropriation* to be equivalent to a fixed proportion of the Parish property tax; an *equalization* allocation of State funds, where necessary, to bring the basic local appropriation to a set per capita amount; and a *matching allocation* of State funds to match in certain ratios the local appropriation. It is felt that such a formula for distribution of State and Federal funds will result in more stable and efficient organization of local health services.

The foregoing is the direction taken by your State Health Department in planning for organization and services through Health Units. Such planning is primarily the province of the public health administrator, but in this he and the practicing physician can meet on common ground, and by sustained and organized effort attain more readily the ultimate goal of optimum health for the individual and the community.

NEW ORLEANS

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THE BCG VACCINE

Tuberculosis must be fought. The battle against it has to be waged by the individual practitioner, by hospitals and institutions, by employee groups and by community welfare campaigns. There is an increase in tuberculosis after every war. Physicians and the public are more conscious of tuberculosis now than in the past. This is due to the recent recognition of the increase following war and to the campaigns in which masses of people have been surveyed with a roentgenogram of the chest.

In this collective effort to control tuberculosis the position of the BCG vaccine is

of pressing concern to the physician and of interest to the public. In 1906 Calmette isolated a strain of tubercle bacillus from the milk of a tuberculous cow. After many subcultures and much animal experimentation a comprehensive paper was published in 1920 by Calmette and Guérin. In this it was indicated that the organism with which they were working had lost its virulence, was nontuberculo-genic, incapable of producing generalized tuberculosis in guinea pigs and cattle but retained antigenic properties and had afforded some degree of protection to inoculated animals. The organism came to be known as *Bacille Calmette-Guérin*, and ultimately, the product as the BCG vaccine.

The results of the first clinical trials in 1924 in France were not statistically convincing to scientists in various countries. Subsequent trials were instituted in various places. The interest was marred at this time by one major (Lubeck, Germany), and two minor disasters (Hungary and Chile) in which tuberculosis followed the administration of the material. These disasters have been shown to be the result of contaminations and not from a return of virulence of the organism. The effect was to increase skepticism.

In the twenty odd years in which the vaccine has been used and its effects discussed there has been much controversy as to its safety and value.

The vaccine has been used in South America, has been given to over 5,000,000 individuals in Europe. It was used extensively in Norway before and during the War. It has been used in various places in this country but received generally here with some caution.

For clarification of the situation, Frederick Tice instigated a comprehensive experimental and clinical study in 1935. It was carried out by various interested groups in Chicago under the direction of Rosenthal and others. After ten years it was stated that in "2,831 new born infants living in the poorest districts of Chicago, but not in household contact with tuber-

culosis, there were 11 cases of tuberculosis in the vaccinated against 39 in the controls. In 256 new born infants, when tuberculosis was present in the household and when isolation in foster homes was practiced in the controls and vaccinated alike, there were 2 cases of tuberculosis in the vaccinated as compared to 5 in the controls. The rate was 4.56 times as great in the controls. There were 4 deaths in the controls and none in the vaccinated."

Two years ago a conference was held under the auspices of the United States Public Health Service to consider the situation in the light of reports such as that given above. It was recommended that BCG vaccine not be made available commercially at present, that extensive investigations be carried out. The American Trudeau Society has advised care and caution in preparation and utilization. They consider that general vaccination is not desirable but that individuals or groups especially vulnerable should be vaccinated—provided they do not react to adequate tuberculin tests.

All are cautioned that immunity is only relative and that all established means of protection and control are important to the vaccinated groups and to the community.

It is stated that there are more than 500,000 cases of tuberculosis in the United States and there is an annual mortality of 50,000. Accordingly, a resource that is apparently safe and may be protective should be given an extensive trial and should be made available to the vulnerable groups.

Q FEVER

In 1935 an outbreak of an unknown fever was observed in Brisbane, Australia. An investigation by Derrick and by Burnet and Freeman established the entity now known as Q fever. The disease occurred in the workers of a meat plant. Nine typical cases were described in the first publication. It was shown that guinea pigs were susceptible to the disease and could be infected by inoculations of blood or urine

from patients during the active phase of the disease. Burnet and Freeman found rickettsial organisms in the liver and spleen of mice inoculated from guinea pigs. The illness was acute. The first complaints were headache, pain in back and limbs, and fever. Mild respiratory symptoms were present in some cases. Leucocyte count was within normal limits and the illness was variable in duration. Milder cases had fever for about nine days; others up to twenty-four days.

In 1938, Davis and Cox reported the recovery of a filter-passing infectious agent from ticks near Missoula, Montana. This organism was later proven to be identical with that found by Burnet and it is now known as *Rickettsia burneti*. Outbreaks of fever and illness caused by this organism have occurred twice in the National Institute of Health and in two laboratories in Australia. During the latter part of World War II outbreaks of Q fever were reported in the Mediterranean area, in Panama, in a military unit returning from Italy to Virginia. In March 1946, Q fever occurred in Amarillo, Texas, among a group employed in the meat industry. In August 1946, a similar outbreak appeared in the employees of a packing house in Chicago. An endemic area of the disease was found in southern California in the spring of 1947.

Much investigation has been done to discover the reservoir and the method of transmission of the disease. The presence of infection is known to exist in certain ticks and small animals of Australia and in certain ticks in the United States. A serological study of over 2000 cows in the Los Angeles endemic area revealed approximately 13 per cent possessed antibodies against Q fever. The *Rickettsia* could not be recovered from the blood, urine, or feces of the cow but were found in raw milk. Pasteurization sterilized the milk but it was not felt that drinking of raw milk was responsible for the majority of human infection. The various outbreaks have occurred mainly in meat workers and labor-

atory workers and in units of military personnel.

The symptomatology and physical findings of the various outbreaks of the disease are similar but would not be susceptible of diagnosis without laboratory means. Pneumonitis was recognized first in 1940. In a certain outbreak in the National Institute of Health there were 45 cases. The incubation period varied from twelve to twenty-three days; there were 13 women and 32 men; their ages were from 18 to 64. The majority complained of headache and general aching, about one-third complained of cough. A few complained of nausea, vomiting, bloody sputum, diarrhea, and constipation.

Among the signs of significance, 32 had chills, 11 rales in the chest, and 10 had fever without chills or sweating. A few had signs of pulmonary consolidation, or conjunctivitis, or dyspnea. In 13 patients there were physical or x-ray signs of pneumonitis; in 32 there was no evidence of pneumonitis. In the latter groups the severity of the illness varied widely. The fever persisted one to fifteen days, the average was about six days. The routine laboratory

studies did not point the way to diagnosis. The total leucocyte count was normal except in one patient with pneumonitis in whom it was 18,000 with 86 per cent neutrophils. Diagnoses were confirmed by positive fixation tests. Sulfadiazine and penicillin were given to many patients having a severe form of the disease but without apparent effect. Other observers reported that fever subsided in ninety-six hours in one patient after streptomycin was given on the ninth day. In the Amarillo outbreak 11 of 18 hospitalized patients had normal temperatures on the twelfth day of illness without specific therapy.

It is seen that Q fever is an acute contagious rickettsial disease spread by means as yet unknown and appears thus far chiefly in localized outbreaks. The disease produces an acute toxemia of variable severity and also a pneumonitis in a certain proportion of patients. It is to be considered along with influenza, primary atypical pneumonia, and the bizarre types of pulmonary infections. It is evident that it will be of growing importance to the physician and he will require experienced laboratory assistance.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

MESSAGES FROM THE PRESIDENT

PARISH MEDICAL SOCIETY

The real strength of organized medicine rests largely in the Parish Medical Society. This is the individual unit, which, added to many others, makes up the whole. The Louisiana State Medical Society is nothing more or less than a combination of the various parish medical societies. At the present time there are forty-five parish medical societies, organized and active. This should be increased so that every parish is organized as an individual unit

or as a bi-parish or tri-parish medical society.

What should the Parish Medical Society accomplish, or what should its duties be? First, of course, it should bring a close, friendly contact between the doctors of the parish. Nothing helps more to establish friendly relations between doctors than parish medical society meetings where our common troubles can be freely discussed. We soon learn that we are all striving for the same goal and need each other's help.

Certainly the parish society should be of some educational value to the doctor. Scien-

tific discussion by members of the local group or by men from the surrounding territory, should accomplish this, and should be of distinct value. The papers or discussions should of course be practical and something of interest and value to the doctors in that particular parish.

As important as these functions are, a parish medical society has even more important duties. It should be the clearing house for all matters pertaining to measures for the improvement of the health and sanitation of the parish. Too often we have failed to make our position in this respect known to the public. Obviously the people of a parish will not seek the advice, or have confidence in a parish society which has not been active and has not demonstrated its interest in the general welfare of that community. Actually the parish society should study the needs of that community, and be the leader in these things, rather than follow the lead of some politician, society, etc.

One cannot help but realize that as a group, we must take a more active interest in such matters. There have always been a few doctors in every part of the state who have taken an active part and have been leaders in matters pertaining to health and the general welfare. This has been helpful, but would be far more effective if it came from the parish society as a body.

It is our hope that we will have an active medical society in every parish in the state, each affiliated with the State Society and each working so as to carry the influence of organized medicine into every part of the state.

M. D. Hargrove, M. D.

LOUISIANA PHYSICIANS SERVICE

It may be accepted as a fixed policy that the American people want some means of prepaying the cost of hospital and medical expense. Our answer to that is in providing an opportunity through voluntary insurance, both for hospital and surgical ex-

pense, which in time will be broadened to cover all medical and surgical expense.

Insurance to cover hospital expense is now on a very firm foundation, having been in use for a number of years. Many doctors looked upon it with some misgiving when it was started, but the great majority of doctors now accept it as a great benefit to their patients and to them. Certainly many an individual has had the burden of hospitalization materially reduced by hospitalization insurance.

Insurance covering medical and surgical fees was started later but in the few years it has been in force has had a very rapid growth. Now, practically every state has some plan of voluntary insurance sponsored by the State Medical Society or a component part of the State Society. Most of the plans have had some difficulties, as is to be expected when new fields are entered. Fortunately they have weathered the storm and generally are steering a smoother course.

The Louisiana State Medical Society started its plan, Louisiana Physicians Service, in the fall of 1946. We, too, have experienced some difficulties, most of which have been overcome, so that we now expect smoother sailing in the future.

It cannot be too strongly impressed upon the doctors of the state that Louisiana Physicians Service is your Company, started and backed by the State Society. It is your serious endeavor to offer to the people of the state a method whereby they can care for their surgical fees by prepayment insurance methods. For those in certain income groups, it covers the entire cost, and you, by becoming participating physicians, have agreed to accept the fee paid by Louisiana Physicians Service as your fee in full. For these people no other form of insurance will satisfy their needs. An indemnity plan for them simply does not go far enough.

In order for Louisiana Physicians Service to succeed and to meet the need for which it was started, it must have the ac-

tive support and cooperation of all doctors. It is your duty, as a member of the Louisiana State Medical Society, to see that the insured individual gets the protection he deserves under the policy. It is also your duty to be equally fair with *your* Company, Louisiana Physicians Service, and see that it gets a fair deal in each case.

You should also be an ardent booster of Louisiana Physicians Service. Whenever the subject of prepayment medical plans is discussed, you should at once speak up for the part your society is taking in that movement. True, we only cover surgical fees at the present time, but you can truthfully say

that we hope to broaden that to cover medical fees as we progress and acquire more experience. Louisiana Physicians Service is supplying a decided need in our state, and as it progresses, will be of increasing benefit to the people of Louisiana.

Be a booster of Louisiana Physicians Service, speak up for it, and help safeguard its interest whenever possible. It is your project, and it needs your support in every way possible.

M. D. Hargrove, M. D.,

President,

Louisiana State Medical Society.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

SEVENTH DISTRICT SOCIETY

The Medical Society of the Seventh Congressional District will hold its fall meeting in Lake Charles, on Friday and Saturday, September 10 and 11. As usual, the Calcasieu Parish Medical Society will be host on this occasion. They are planning a full scientific program with distinguished guest speakers from out of the city as well as some of the leading physicians and surgeons of our state.

The Calcasieu Parish Medical Society is certainly to be congratulated on this effort to bring together not only the doctors of the Seventh District, but of outlying parishes and areas, to be the recipients of such a scientific treat. This statement is predicated on the fact that previous meetings similar in character have been outstanding scientifically and enjoyed by the great number of physicians who attended. We feel sure that the present meeting will exceed the efforts made in the past so that all who will attend shall be assured of a successful meeting.

Mark your calendar for September 10 and 11, Lake Charles.

The final program will very shortly be disseminated to all the physicians of the district and surrounding areas. You are urgently requested to avail yourself of this unusual opportunity.

NATCHITOCHE PARISH SOCIETY

A meeting of the Natchitoches Parish Medical Society was held at the home of Dr. Joseph Bath, President, on Tuesday, July 13. At this meeting Dr. M. D. Hargrove, President of the State Society, spoke. Dr. Bath presided at the business meeting, after which a delicious supper was served.

THE SOUTHERN MEDICAL ASSOCIATION MEETING

The forty-second annual meeting of the Southern Medical Association will be held at Miami, Florida on October 25-28 with the Dade County Medical Association as sponsor.

At a meeting of the Executive Committee on July 24, Dinner Key was selected as general headquarters for the following: registration; all section meetings, scientific, technical and hobby ex-

hibits; and motion pictures. Dinner Key (the former Pan American Air Depot) is ten minutes' ride from the general hotel headquarters and makes it possible to hold all of the above activities in one location. There is parking space for over a thousand automobiles around the main building.

The evening programs, which will include the General Public Session, the General Session and the President's Ball, will be held at the Municipal Auditorium. The auditorium is just off of Biscayne Boulevard and is only a short distance from the general hotel headquarters.

Hotel reservations will be handled by the Hotel Committee, Southern Medical Association Meeting, c/o City of Miami Convention Bureau, 320 N. E. Fifth Street, Miami 32, Florida. Since the meeting is being held earlier than usual, all requests for rooms should be made immediately.

REGIONAL CANCER CONFERENCE

The second Southwest Regional Cancer Conference will be held in Fort Worth, Texas on October 12 at the Blackstone Hotel under the auspices of the Tarrant County Medical Society and the Fort Worth Unit, Texas Division, American Cancer Society.

The one-day conference will consist of morning and afternoon lecture sessions, a clinical luncheon with an open forum question and answer period, and a public meeting in the evening.

Guest speakers at the conference will include: Dr. Chas. Huggins, Chicago, Professor of Surgery, University of Chicago; Dr. A. R. Curreri, Madison, Wisconsin, Associate Professor of Surgery, Wisconsin Medical School; Dr. James Barrett Brown, St. Louis, Associate Professor of Clinical Surgery, Washington University School of Medicine, and Associate Professor of Oral Surgery, Washington University School of Dentistry; Dr. Robert A. Moore, St. Louis, Professor of Pathology, Washington University School of Medicine.

There will be no registration fee. Further information about the conference may be obtained from the Tarrant County Medical Society, 209 Medical Arts Building, Fort Worth 2, Texas.

NATIONAL SOCIETY FOR CRIPPLED CHILDREN CONVENTION

The 28th annual convention of the National Society for Crippled Children & Adults, Inc., will be held at the La Salle Hotel, Chicago, November 15-17.

Many outstanding speakers in the fields of medicine, health and education will be on hand to present facts on progress in work with the handicapped during the past year, according to Lawrence J. Linck, executive director.

The convention will be attended by physicians, therapists, educators, workers with the handicapped and representatives of National Society's more than 2,000 states and local units throughout the United States, Canada, Alaska and Hawaii.

FOOD AND DRUG ADMINISTRATION

Druggists and the medical profession were urged today by the Federal Security Agency's Food and Drug Administration to return all stocks of Siliform Ampuls to the manufacturer, The Heilkraft Medical Company, Boston, Mass. This injection drug, which should be sterile, is potentially dangerous since samples collected on the market contain living organisms. Siliform is injected by some physicians and osteopaths in the belief that it will relieve patients suffering with rheumatism as claimed by the manufacturer. The Food and Drug Administration found the contaminated samples after a routine inspection at the Heilkraft factory disclosed that the Siliform Ampuls had been manufactured without sterilization. Intensive recall efforts by the manufacturer and the Food and Drug Administration for the past two weeks have not brought in all of the contaminated stocks. The article, which moves slowly, was shipped to 37 states from Maine to California and later was redistributed by wholesalers who cannot trace many of their sales. Some going back as far as 1946 have been found on the market. These ampuls may be in the hands of doctors, hospitals, clinics, and retail and wholesale druggists.

WOMAN'S AUXILIARY

The Woman's Auxiliary to the Louisiana State Medical Society has received this notice from the National Auxiliary Treasurer, our own Mrs. A. A. Herold, Shreveport. "The post-Convention meeting of the Board of Directors was held on June 24th, 1948. At this meeting the Board suggested I write to you and attempt to clarify for you some of the action taken at the Convention by the House of Delegates.

You perhaps recall that on June 23rd, the Convention adopted the following revision to the Constitution and By-Laws: Chapter VII. constituent Auxiliaries, Section 4, now reads—"Each constituent Auxiliary shall transmit to the Treasurer of this Auxiliary not later than March 15th annually dues amounting to one dollar for each of its members for the current year, which shall include subscription to the periodicals published by this Auxiliary, when authorized by the Advisory Council to the Woman's Auxiliary. This means in other words, that until the American Medical Association publishes the new periodicals and receives from the advertisements in the new publication enough funds to finance both this new publication and our Bulletin, we continue to pay a dollar for dues and another dollar for a year's subscription to the Bulletin.

For the present, the dollar sent to the State Treasurer for National dues does not include any subscription to any publication. This revision also became effective immediately upon its adoption, therefore, any dues paid prior to June 23rd should have been twenty-five cents, but any dues paid since that date must be one dollar. I hope this

explanation has helped you a little to understand the situation as it now stands regarding dues and publications."

This, of course, means that of the one dollar and a half collected now for State and National dues from each member of the Louisiana Auxiliary, one dollar will go to National and fifty cents will go to the State. The one dollar will be collected for the Bulletin as usual until further notice. Read your Convention issue of the Bulletin for further information. Continue to read the Organization

section of this Journal and the A.M.A. Journal as well as the Bulletin, Hygeia and our own quarterly. The first copy of "News and Views" should be in your hands now. A vote of thanks should go to your President, Mrs. O. B. Owens and her assistants and also to Dr. A. V. Friedrichs, Dr. P. T. Talbot and the entire Council on Medical Service and Public Relations.

MRS. F. U. DARBY,
Press & Publicity Chairman.

BOOK REVIEWS

Physiology of Exercise: By Laurence E. Morehouse, Ph. D. and Augustus T. Miller, Jr., Ph. D., St. Louis, The C. V. Mosby Company, 1948. Pp. 353. Price, \$4.75.

This is a small monograph embodying much of the work from the Harvard Fatigue Laboratory which was done before and during the war. It contains reviews of the physiology of muscle, circulation and respiration as introductions to the specific effects of exercise on the system. There are also brief chapters on skill, endurance, fatigue, physical fitness, training and diet.

It is questionable whether this monograph will be of any real value to the physician or to the advanced student interested in the subject of exercise. It will appeal more particularly to the more elementary student in physiology or physical education for whom it was obviously written. For the latter it should provide an excellent text. Perhaps the most valuable part of the book is the extensive bibliography added to each chapter. This bibliography contains review articles dealing with various aspects of the problem and is reasonably up to date, although it would seem that some of the more recent work done during the war might have been included.

H. S. MAYERSON, Ph. D.

Essays in Historical Medicine: By Bernard J. Ficarra, A. B., Sc. B., M. D. New York, Froben Press, 1948. Pp. 220. Price, \$5.00.

This small volume contains eight essays, four of which have been reprinted from the periodicals in which they originally appeared. The subjects treated are: American Pioneers in Abdominal Surgery, Amputations and Prostheses through the Centuries, Famous Cripples of the Past, Surgical References in Shakespeare, Evolution of Blood Transfusion, Walter Reed at Kings County Hospital, An Historical View of Pathology and Famous Autopsies in History. The last-named essay

includes descriptions of the autopsies on our three martyred Presidents.

The typography and general physical make-up of the book are good. It is unfortunate that some of the numerous illustrations are poorly reproduced. This title is a welcome addition to the historical section of the doctor's private library.

MARY LOUISE MARSHALL

The Oculorotary Muscles: By Richard G. Scobee, M. D. St. Louis, C. V. Mosby Company, 1947. Pp. 359. Price, \$8.00.

The author has presented the subject from the standpoint of the clinician and in an orthodox manner. This book of some three hundred and fifty pages is the evolution of a series of lectures which the author has given numerous times, and represents a thorough understanding of the principles involved in the examination and care of patients with neuromuscular ocular disease. Although it does not present the technical advances which have been described by other recent authors on this subject, it will give the average reader a better understanding of the complexities encountered. The author has, to an exceptional degree, the ability to simplify complex and difficult concepts, and to adapt them in a practical manner for use by the average ophthalmologist. The use of specific questions and answers facilitates usability, as well as readability. The table of contents is especially well organized. The illustrations are numerous and well chosen. The alphabetic index is of moderate length and fairly comprehensive. Especially the younger ophthalmologist will make no mistake in reading and re-reading this excellent work.

CHAS. A. BAHN, M. D.

PUBLICATIONS RECEIVED

Blakiston Company, Philadelphia: Medical Writing (2nd edition), by Morris Fishbein, M. D.; Re-

cent Advances in Obstetrics and Gynaecology (7th edition), by Aleck W. Bourne, M. A., M. B., B. Ch. (Camb.), F. R. C. S. (Eng.), F. R. C. O. G. and Leslie H. Williams, M. D., M. S. (Lond.), F. R. C. S. (Eng.), F. R. C. O. G.

C. V. Mosby Company, St. Louis: Preoperative and Postoperative Care of Surgical Patients, by

Hugh C. Ilgenfritz, A. B., M. D., F. A. C. S.

W. B. Saunders Company, Philadelphia: General Endocrinology, by C. Donnell Turner, Ph. D.

The Williams & Wilkins Company, Baltimore: Human Nutrition, by V. H. Mottram, M. A. (Cant.); Manual of Leprosy, by Ernest Muir, C. M. G., C. I. E., M. D., F. R. C. S. Edin.

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SYMPOSIUM ON HYPERTENSION THE APPLICATION OF FUNDAMENTAL KNOWLEDGE TO THE CLINICAL PROBLEM OF HYPERTENSION*

RAYMOND GREGORY, M. D.
GALVESTON, TEXAS

The title of this paper was chosen for two reasons: First, to enable me to present to you those fundamental facts which will orient you to the problems of hypertension. And second, to permit me to emphasize the necessity for fundamental research in the solution of the great number of problems in medicine which remain unsolved. The older methods of clinical medicine have been largely descriptive. They have accumulated a vast amount of factual information which has enabled us to recognize and classify diseases and disease syndromes. In many instances in the past, however, and in more instances in the future, the curtain of ignorance and misunderstanding will be rolled back only by the application of the fundamental disciplines of the medical sciences to the problem of clinical medicine. I usually object to the use of the term "Medical Sciences" to distinguish physiology, chemistry, bacteriology, pathology, etc. from clinical medicine. The term is often used in a condescending manner. Clinical medicine

can and should be as scientific as the other disciplines. Whatever there is of solid worth in clinical medicine is based upon these fundamental sciences.

Further, I hope I am not presumptuous in emphasizing to this audience the great importance of both animal and clinical investigations as essential approaches to the solution of clinical problems. The conditions under which these types of investigation must go on are exacting, time-consuming and costly. Physicians may be of inestimable value in the education of the public and the loosening of the strings on the money bags controlled by both private and public sources of funds.

I am sure that it is accurate to state that many of the unsolved problems of medicine would have been solved by now if society were willing to spend on these problems the amount that they spend on research in steel, plastics or petroleum. While it is the hard-headed business man who realizes the importance of research in industry and directs funds into these channels, it is the public that pays the bills. The public must therefore be educated to spend more money on medical research. The alternative is to do it anyway under the direction of some bureau in Washington.

All this is by way of leading up to calling your attention to the recently established "The American Foundation for High Blood Pressure." It is the purpose of this organization to foster, encourage and support research in the field of vascular diseases, and to solicit and dispense funds in further support of these purposes. In the not too distant future, the purposes of the organiza-

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Presented at the Sixty-seventh Annual Meeting of the Louisiana State Medical Society, New Orleans, May 13, 1947.

tion will be called to your attention in some way. May I urge your support of this organization in every way that you can.

The magnitude of the problem is shown by the figures in Table I which are taken from the reports of the U. S. Bureau of the Census. If one totals the number of deaths which are reported to be due to:

1. Intracranial lesions of vascular origin,
2. Diseases of the coronary arteries and angina pectoris,
3. Diseases of heart (other forms),
4. Nephritis,
5. High blood pressure,

one obtains a fair idea of the number of deaths which are due to or are contributed to by hypertension. Incidentally one also learns the necessity for emphasizing to the practicing physician that he is reporting the cause of many deaths erroneously. The vast majority of the deaths in the five categories above are most likely due to essential hypertension and should be so reported instead of reporting them as deaths due to disease of the heart, the brain or the kidney. For the five years indicated in the report of the U. S. Bureau of the Census, there is an average of only 1,662 deaths per year attributed to high blood pressure. I feel sure that there are close to that number who die annually in New Orleans alone as a result of this disease.

With this more accurate evaluation of the causes of death, one finds that approximately one-third of all deaths in the U. S. are due wholly or in part to essential hypertension. This disease also kills or contributes to the death of seven to eight times as many people as all forms of tuberculosis; more than fifteen times as many deaths as are due to acute and chronic rheumatic heart disease; more than twenty-five times more than are caused by syphilis; more than four hundred times the number who died of poliomyelitis; approximately two and one-half times the number due to cancer and about five times the number due to pneumonia and influenza combined. If the above facts are kept in mind, and the amount of money now being spent on the study of some of the diseases mentioned

be compared, it will be obvious that the availability of much larger sums of money for research in vascular diseases is long over due.

In spite of the importance of essential hypertension as a cause of sickness and death, and in spite of great effort which has been devoted to the subject in recent years as a result of the work of Goldblatt the etiology of this abnormality remains unknown. Attempts to define the etiology of essential hypertension have been directed principally from the following viewpoints: (a) the kidney: as a source of nervous reflexes and other mechanisms. (b) the vasomotor apparatus, (c) humoral mechanism—arising in the kidney or other organs, (d) the kidney as a source of a substance which prevents the development of hypertension, and (e) endocrines.

A. THE KIDNEY AS THE CAUSE OF ESSENTIAL HYPERTENSION

Richard Bright¹ first showed that renal disease may produce hypertension. Bright's ideas regarding the relation of diseases of the kidney to high blood pressure were deduced from his observation of the high degree of correlation between renal disease and cardiac hypertrophy in the absence of intrinsic cardiac disease. His clinical and pathological observations founded the school which believes in the etiological relationship between renal disease and hypertension. This concept has been contributed to by other important workers in the field of renal diseases (Jores,² Volhard and Fahr³). The validity of the hypothesis of the renal origin of hypertension may have been an impetus to Goldblatt (1934,^{4a} 1937^{4b}) whose work showed so conclusively that the kidney may be the origin of pathological physiological processes which cause hypertension. Goldblatt's results have been confirmed and extended. These experiments have further directed attention to abnormalities of the kidney as a cause of hypertension. The original studies of Goldblatt (1934)^{4a} and co-workers focused attention on the kidney as the organ which may give rise to hypertension under certain conditions. It remained for Goldblatt and others, particularly Houssay and Braun-

TABLE 1—CAUSES OF DEATH IN THE UNITED STATES

	1940	1941	1942	1943	1944	Average
Total death U. S. all causes	1,417,269	1,397,642	1,385,187	1,459,544	1,411,338	1,414,196
Intracranial lesions of vascular origin	119,853	118,584	120,652	127,300	124,250	122,128
Diseases of coronary arteries and angina pectoris	101,463	107,166	113,636	120,725	124,493	113,497
Diseases of heart (other forms)	256,298	252,650	255,983	278,470	268,030	131,143
Nephritis	107,351	99,951	96,907	99,267	91,687	49,517
High blood pressure	1,374		1,691	1,829	1,753	1,662
TOTAL						417,847
Acute rheumatic fever	1,725	1,640	1,527	1,501	1,471	1,573
Chronic rheumatic diseases of heart	27,430	26,325	25,296	27,196	25,539	26,357
Tuberculosis (all forms)	59,428	59,251	57,690	57,005	54,731	57,621
Syphilis	19,006	17,728	16,345	16,263	14,916	16,852
Polio-myelitis (polio-encephalitis)	1,026	807	561	1,151	1,361	981
Cancer (all forms and sites)	158,335	159,926	163,400	166,848	171,171	163,336
Pneumonia (all forms) and influenza	72,525	84,962	74,532	90,115	81,804	80,792
TOTAL						348,112

Menendez,⁹ to elucidate the mechanism by which renal ischemia produces hypertension.

The role played by the nervous system in general and particularly by the nerve supply of the kidneys in experimental hypertension due to renal ischemia has been thoroughly investigated. Goldblatt, Gross, and Hanzal⁶ were unable to lower the blood pressure of dogs, made hypertensive by renal ischemia, by resection of the splanchnic nerves; nor were they able to prevent it by splanchnic resection prior to the production of renal ischemia. Goldblatt and Wartman⁷ found that section of anterior spinal roots from the sixth thoracic to the second lumbar inclusive did not prevent or reduce hypertension produced in dogs by partial constriction of main renal arteries. Page⁸ (1935) and Collins⁹ observed no change following section of the renal nerves in the blood pressure of experimental hypertension caused by renal ischemia in dogs. Even total thoracic and abdominal sympathectomy with cardiac denervation failed to prevent the development of or to lower the elevated blood pressures produced by renal ischemia (Freeman and Page¹⁰), Blalock and Levy¹¹ and Glenn, Child and Heuer¹² showed that the nerve supply of the kidney was not essential to the development of hypertension caused by renal ischemia by producing hypertension in dogs with ischemia of a transplanted kidney. These results have been adequately confirmed and it appears that the nerve supply of the kidney and the functional integrity of the sympathetic nervous system are not essential to the production or maintenance of hypertension due to renal ischemia. The results of Dock and Rytand¹³ are not in agreement with this, however. They found the brain and cord essential to the maintenance of experimental renal hypertension in rats. They concluded that the pressor substance present in the plasma of rats with renal hypertension has no peripheral vasoconstrictor action, but acts through the vasomotor center. Pithing the cord may be criticized on the grounds that this results in such a poor physiological preparation that results with such a preparation would

not be reliable. They showed, however, that epinephrine and pituitrin, known to act in the periphery, continued to produce transient rises in pressure in their hypertensive rats after pressures were reduced by pithing.

Goldblatt (1937)^{4b} stated further that failure of surgery on the sympathetic nervous system to alter or prevent the development of hypertension in the dog with renal ischemia tends to minimize the role of the vasomotor apparatus of all parts of the body except the kidney so far as the cause of hypertension is concerned. If this be true, the question should be raised concerning the mechanism by which the kidney initiates the elevation of blood pressure. By implication, Goldblatt apparently believes that vasomotor impulses to the kidney are important in the genesis of hypertension. If this be so, what causes the abnormal vasomotor function to the kidney? Goldblatt (1937) stated also that failure of various surgical procedures on the nervous system to lower the blood pressure in experimental hypertension does not support the operations performed on human beings with hypertension; but it does not necessarily disprove, however, the reports of beneficial effects obtained by these procedures in some cases of human hypertension. He emphasized that sympathectomy can not influence the silver clamp on the renal artery which has caused the ischemic kidney to produce a humoral pressor substance. He also emphasized, however, the possibility that constricted renal arterioles may produce renal ischemia, and thereby, a pressor substance in the kidney; and that this arteriolar constriction might be relaxed by interruption of vasomotor impulses to the kidney with resulting correction of renal ischemia producing the hypothetical pressor substance. In this regard the work of Weeks et al¹⁴ should be mentioned. They found that unilateral splenorenopexy in dogs caused elevated blood pressures produced by renal ischemia to return to normal. They attributed this effect to the correction of renal ischemia by a better collateral blood supply around

the tubules. They found, however, that omentorenopexy produced only a temporary fall in dogs with hypertension due to renal ischemia. Goldberg, Rodbard and Katz¹⁵ reported that increasing the collateral circulation to the kidney by decapsulation and transplantation of the kidney to a muscle bed led to a temporary fall in the blood pressure in dogs with hypertension due to renal ischemia. When a normal dog had this performed beforehand, it did not interfere with the development of hypertension by subsequent partial occlusion of the renal artery. Katz et al explained the failure of this procedure to lower the blood pressure to probable compression of the kidney by scar tissue. This would not appear to be the case inasmuch as the blood pressure returned to previous levels within such a few days after operation. Undoubtedly scar tissue resulted from the splenorenopexy reported by Weeks et al but the blood pressure fell to normal levels. Regardless of the mechanism involved, Katz stated that operations designed to increase the collateral circulation to the kidney are unjustified as a means of treatment of hypertension of any sort, even the so-called "renal" hypertension.

Page and Heuer (1935)¹⁶ found the arterial blood pressure unchanged by denervation of the kidneys in one case of essential hypertension. They concluded that this showed that nervous impulses originating in the kidneys did not share in the maintenance or genesis of hypertension. If this be true, it seems equally true that nerve impulses coming to the kidney must not have shared in the genesis of the hypertension unless it is assumed that too much organic damage had already been done by the time denervation was done. This appears unlikely because this patient's renal function was normal before denervation, as indicated by the urea clearance and concentrating power of the kidneys.

Hypertension may also be produced in man by renal ischemia (Leiter,^{17a} Freeman^{17b} and Hartley, Leadbetter and Burkland,^{17c} Boyd and Lewis,^{17d} Oppenheimer, Klemperer, and Moschkowitz,^{17e} Nesbit and

Ratliff,^{17f} Blatt and Page,^{17g} Barker and Walters,^{17h} Bartels and Leadbetter,¹⁷ⁱ Longcope,^{17j} and Butler^{17k}). This is evidenced by the association of hypertension with lesions which partially obstruct the renal artery or intrarenal circulation and by the disappearance of hypertension following the removal of the ischemic kidney in some instances. A humoral mechanism of renal origin is accepted as the probable cause of hypertension in acute and chronic nephritis, chronic pyelonephritis, polycystic kidneys, renal amyloidosis, as well as in other less commonly encountered renal abnormalities such as tumor masses which partially obstruct the renal artery (Fishberg).¹⁸

The clinical and experimental work referred to appears to have established that renal vascular disease or abnormality may produce hypertension. Of this conclusion, there should be no valid doubt. This does not prove, however, that essential hypertension is produced in the same manner.

B. VASOMOTOR ASPECTS OF ESSENTIAL HYPERTENSION

Many earlier concepts of this etiology of essential hypertension have been based on this. While it is an obvious possibility, it has never been proved. The most that may be correctly said for it is that the cause of elevated blood pressure is compatible with vasoconstriction of vasomotor origin. Contributions to the possibility of a vasomotor etiology of essential hypertension have been made from diverse directions. From examination of pathological tissues, Gull and Sutton¹⁹ concluded that the diffuse vascular disease found in patients with hypertension is a primary pathological entity. Whether they were correct or not, their conclusions first stressed the non-renal origin of hypertension. Allbutt²⁰ concluded that high blood pressure was primarily due to widespread vasoconstriction and that organic changes in smaller vessels were due to persistent hypertension, from his observations that organic arteriolar disease was not extensive enough to account for continued hypertension in some patients. The question of the cause of the vasoconstriction was not answered. Allbutt did not believe that the kidneys played a significant

role in the production of essential hypertension.

The failure of investigators to find renal disease in a small percentage of patients with hypertension has supported contentions that essential hypertension is primarily a generalized vascular disease and that organic renal pathology is secondary to the vascular disease. These observations apparently indicate that hypertension may exist without a persistent anatomical explanation for renal ischemia. If renal ischemia exists in these cases, it must obviously result from functional constriction of the renal blood supply. If this be the case, what produces the physiological constriction? If it is initiated by spasm, the possible role of the sympathetic nervous system is an obvious, though not a proved, one.

There is difference of opinion regarding the frequency with which one meets with hypertension which is not associated with significant renal pathology. Herxheimer and Schulz²¹ said that renal arteriosclerosis is found in 97 per cent of cases with hypertension. Bell and Clawson²² stated that 90 per cent of patients with hypertension with cardiac hypertrophy have renal arteriosclerosis. This appears to be a significant fact. If only 90 per cent of hypertensive patients who have had the disease long enough to produce cardiac hypertrophy have renal arteriosclerosis, it seems probable that many more than 10 per cent of the cases have early hypertension without renal vascular disease. In this connection, Kimmelstiel and Wilson²³ stated that it must be borne in mind that less than 50 per cent of cases of essential hypertension show a completely diffuse arteriosclerosis if mechanical obstruction to the circulation through the kidney is to be considered as a contributory factor to the hypertension. Jaffe²⁴ reported an increase in the diameter of the afferent glomerular arteriole in the early phases of hypertension. Fishberg¹⁸ said that an intact kidney in essential hypertension is uncommon.

While the finding of hypertension unassociated with demonstrable renal pathol-

ogy appears to be generally accepted, the most that one can conclude from it is that hypertension may be due to a non-renal cause. Any tendency to assume that this non-renal cause is therefore vasomotor in type is not justified and certainly not proved. The existence of essential hypertension without renal pathology does admit of the possibility that it might be due to vasomotor causes, however.

There are conflicting conclusions concerning the vasomotor apparatus in the production of essential hypertension. Older work emphasized the etiologic role of the vasomotor function in hypertension while much of the newer work is in disagreement with vasomotor etiology. Weiss and Ellis²⁵ showed that the average resistance of the arteriolar system in patients with hypertension was twice that of normal subjects. The blood volume and cardiac output per minute were normal. While the demonstrated vasoconstriction is possibly of vasomotor origin, there is no proof that such exists. Von Monakow²⁶ reported that vasomotor centers are hyperirritable in hypertension. Hines and Brown²⁷ obtained results with their "Cold Stimulation Test" that led them to conclude that hypertension is due to vasomotor irritability. They reported that 98 per cent of subjects with essential hypertension exhibited excessive reactions to cold. Particularly interesting, from the standpoint of the present study, is their finding that general anesthesia completely obliterated the response, and spinal anesthesia, with sensory anesthesia to the nipple line or even the umbilicus, essentially prevented any vasomotor response to the application of cold. These results emphasize the possible importance of the central nervous system as a cause or sustaining mechanism in essential hypertension. Raab²⁸ found that patients with essential hypertension responded to inhalation of carbon dioxide with rises of blood pressure several times greater than normal subjects. Normal responses were obtained in patients with hypertension due to nephritis. Mueller and Brown's²⁹ observations of the extreme fluctuations of blood

pressure during waking and sleeping supported the hypothesis of the vasomotor etiology of essential hypertension. Miller and Bruger³⁰ confirmed the work of both Hines and Brown and Raab by finding that 76 per cent of patients with essential hypertension gave excessive responses to the coldpressor test, while chronic nephritis with hypertension responded similarly to normal subjects. Their results were confirmed by Alam and Smirk.³¹ The difference in the reactions of essential and nephritic hypertensives to various tests by Raab, Miller and Bruger, and Alam and Smirk supports the possible difference in etiology of the two conditions. This is not agreed to by more recent workers, who favor a humoral mechanism for all types of hypertension (Prinzmetal and Wilson).³²

All published work does not agree that there is a difference in etiology of the two types of hypertension ("renal" and "essential"). Pickering³³ concluded that hypertonus of blood vessels in essential and renal hypertension was not due to a nervous mechanism. He speculated on the possibility of a local excess of pressor or lack of depressor substances in the vessels or tissues surrounding the vessels. Prinzmetal and Wilson³² stated that hypertonus of blood vessels in all forms of hypertension studied was independent of vasomotor control. The conclusions of Prinzmetal and Wilson in coarctation of the aorta do not agree with those of Pickering. The former interpreted their results in coarctation of the aorta to indicate that the hypertension was of vasomotor origin. Pickering speculated that there was a congenital lack of growth of vessels as the cause of hypertension in coarctation of the aorta. The results and interpretations of Pickering and of Prinzmetal and Wilson are in agreement on essential and nephritic hypertension, and in complete disagreement regarding coarctation of the aorta. Are their methods as reliable as they believe?

The relation of vasomotor function to the etiology of essential hypertension has been studied to advantage by various surgical attacks on the sympathetic nervous sys-

tems of hypertensive patients in addition to those to which reference has been made on animals made hypertensive by renal ischemia. Adson and Brown,³⁴ Page and Heuer³⁵ (1935, 1937), Freyberg and Peet,³⁶ and Craig and Brown³⁷ have employed surgery on the sympathetic nervous system in the treatment of hypertension. All have claimed some success. Goldblatt (1937)^{4b} stated that surgical procedures on the sympathetic nervous system which result in a lowering of blood pressure have only one thing in common—a denervation of the kidneys. He theorized that renal denervation may result in a better blood supply to the kidneys, the resulting decrease in ischemia possibly causing decreased production of renal pressor substance by ischemia kidneys. By the same right to theorize, one may argue that the loss of sympathetic impulses to the kidneys is not likely to result in a "corrective" amount of vasodilation of the renal arterioles unless such impulses initially caused the excessive vasoconstriction of the renal arterioles. Pickering³³ stated that the significance of the falls in blood pressure following section of splanchnic nerves and removal of lumbar sympathetic chains "is in doubt until we know the effects of similar operations in subjects with normal blood pressures." The effects of spinal anesthesia on normal blood pressures, which we have reported, is the nearest to this of which we are aware.

It is theoretically conceivable that essential hypertension may be initiated by excessive vasomotor impulses and the persistently elevated pressure results in anatomical change in the renal arterioles that causes ischemia which produces a pressor substance in the kidney. Renal ischemia as the cause of experimental hypertension in animals and one which may operate in human beings has been discussed.

The literature is conflicting concerning the role played by the vasomotor function in the production of essential hypertension. While some abnormality of the vasomotor function is an attractive possibility, and the literature cited above is partially in con-

formity with this possibility, no conclusive proof is available that this is the cause of essential hypertension.

C. HUMORAL MECHANISM FOR PRODUCTION OF HYPERTENSION

Certain abnormalities of the adrenal medulla and the adrenal cortex are known to be associated with a hypertensive state in patients. Surgical removal of these abnormalities usually causes the hypertension to return to normal levels. It is not believed, however, that these conditions are the cause of "essential hypertension" (Fishberg).

The work of Goldblatt et al (1934),^{4a} confirmed and extended by many, has directed attention to the humoral mechanism involved in the production of experimental hypertension in animals by renal ischemia. Kohlstaedt, Helmer and Page (1938,³⁸ 1940³⁹), and Plentl⁴⁰ and Page have made significant contributions to the problem of specific humoral substance which may be involved with work on "angiotonin." Goldblatt (1937)⁴¹ has also suggested, on the basis of experimental evidence, that the adrenal cortex and pituitary may play a part in the development of experimental hypertension produced by renal ischemia. This has been confirmed by Blalock and Levy.⁴¹ This effect may be due to the general systemic requirements of these substances for health rather than to any specific relationship. Although newer experimental evidence supports a humoral mechanism as a possible cause of hypertension, and the clinical evidence previously mentioned supports the belief that hypertension due to renal ischemia does occur in human beings, the literature is confusing regarding attempts to isolate a pressor substance from the blood or tissues of patients with hypertension.

Much effort has been given to study of the humoral substance which is probably the cause of experimental hypertension due to renal ischemia and which may possibly be the cause of essential hypertension. Kohlstaedt, Helmer and Page (1938,³⁸ 1940³⁹), and Plentl and Page⁴⁰ reported that the substance produced by the ischemic kidney in experimental hypertension and

probably by the patient with essential hypertension is renin which is activated by a globulin fraction of blood plasma, called "renin-activator," to form "angiotonin." Tigerstedt⁴¹ discovered renin in the normal kidney many years ago. Page and his collaborators have crystallized angiotonin. They have also studied a purified renin and renin activator and concluded that the activation is enzymatic (Plentl and Page). Contrary to an earlier publication, they concluded recently (1943) that renin is the enzyme and "renin activator" is the substrate.

The literature is conflicting regarding pressor compounds in the blood of hypertensive patients or in the blood of animals made hypertensive by renal ischemia. Danzer, Brody and Miles⁴² reported that the blood of patients with hypertension contained a pressor substance not found in rabbit's blood or in the blood of patients with normal blood pressure. Curtis, Mancieff, and Wright⁴³ duplicated the work of Danzer et al but found no pressor substance in the blood of patients with hypertension. Both investigations may be criticized because blood of human beings was injected into an animal of another species, the cat. Bohn⁴⁴ claimed that he had demonstrated a pressor substance in an alcoholic, protein-free extract of citrated blood from "pale" hypertensives (nephritics), but that similar extracts of blood of both normal individuals and "red" hypertensives (essential hypertension) produced a fall in blood pressure. He, too, injected extracts of human blood into an animal of a heterologous species. De Wesselow and Griffiths⁴⁵ were unable to confirm Bohn's results. They could adduce no evidence of a pressor substance in the blood of patients with essential hypertension. Ultrafiltrates from plasma showed no effect with the exception of a slight pressor effect produced by an ultrafiltrate of blood from a patient with chronic glomerulo-nephritis with slight renal failure. Aitken and Wilson⁴⁶ were also unable to confirm the claim of Bohn that bloods of "pale" hypertensive patients contained a pressor substance. Page (1935)⁴⁷ reported

that blood and cerebrospinal fluids of normal individuals and ascitic fluids contained a pressor substance. He could not demonstrate any increase of this pressor substance in the blood or cerebrospinal fluids of patients having hypertension. Interestingly, he observed that the medulla and spinal cord were essential for the production of this pressor effect. Fasciolo, Hous-say, and Taquini⁴⁸ stated that blood from the renal vein of a dog's ischemic kidney contains more pressor substance than blood which had passed through a dog's normal kidney. They used a perfusion technic on the South American toad. Using frogs, bullfrogs, and toads from the southern part of the United States of America, Mason and Rozzell⁴⁹ were unable to confirm the results of Houssay and co-workers. The use of such widely different species as the dog and the frog is again open to criticism. Page (1940),⁵⁰ using the perfused rabbit's ear, stated that "since vasoconstriction occurs under the same experimental conditions with plasma from both hypertensive patients and dogs, this is considered cogent evidence in favor of the view that the chemical mediator of both is similar and is possibly angiotonin."

While the methods used are perhaps open to question on the grounds mentioned, the results of injecting blood, plasma, or extracts of blood and of plasma from hypertensive patients into other animals have failed to demonstrate conclusively the presence of a pressor substance in the blood hypertensive patients.

The possible production of a pressor substance by hypertensive patients and animals has been studied with extracts of kidneys. Prinzmetal and Friedman⁵¹ reported considerable variation in the results obtained from injecting extracts of kidneys from patients with high blood pressures. Although there was overlapping, the average rise of blood pressure from extracts of the former was 12 millimeter of mercury while the average rise from the latter group was 28 millimeters of mercury when identical amounts of the two different extracts were injected into dogs. They also

studied extracts from the kidneys of dogs in which one kidney was made ischemic. The other kidney was not disturbed. In 11 of 14 dogs the extract from the ischemic kidney contained a greater amount of pressor substance than an extract from the normal kidney. Harrison, Blalock and Mason⁵² obtained similar results with dogs made hypertensive by both renal ischemia and ureteral ligation. Landis⁵³ found no evidence that extracts of kidneys from patients with benign hypertension or chronic glomerulonephritis contained any greater amount of pressor substance than did extracts of normal kidneys. Extracts from kidneys of patients with malignant nephrosclerosis produced slightly greater pressor effects.

Published evidence indicates that ischemic kidneys of hypertensive dogs contain a greater amount of pressor substance than do normal kidneys of dogs. An excessive amount of pressor substance in the kidneys of hypertensive patients has not been demonstrated. This may be due to post mortem destruction before or during the preparation of the extract. The evidence concerning a pressor substance in the blood of hypertensive dogs is still too conflicting to permit of any conclusions.

An important contribution is the report of Pickering who observed no effects on the blood pressures of anemic patients as a result of transfusing them with as much as 600 cc. of blood from hypertensive patients. Pickering raises an obvious criticism that a pressor substance may be present in the blood but that it may be quickly destroyed or diluted with resulting lack of pressor effect. He believed, however, that the methods he used controlling the lapsed time properly answer this criticism. He concluded that his results are opposed to the idea that essential hypertension is due to an excess of pressor substance in the circulating blood.

Convincing evidence has been adduced that hypertension produced by renal ischemia is due to a circulating pressor substance formed in the ischemic kidney. There is no convincing proof, however, that es-

sential hypertension is due to or associated with the circulation of a pressor substance in the blood of such patients. In summary, it has been stated "the results of various experiments indicate that this type of experimental hypertension (renal ischemia) is due primarily to a humoral and not to a nervous mechanism initiated by the ischemia of the kidneys" (Goldblatt, 1937). The literature is in complete agreement with this. It must be emphasized, as Goldblatt has done, that while this may also be the cause of essential hypertension; and, as Prinzmetal and Wilson contend, of all types of hypertension, the conclusion is valid only so far as the hypertension associated with proved renal ischemia is concerned.

Study of the effect of spinal anesthesia on the levels of blood pressures in patients with essential hypertension has produced data which do not support a humoral mechanism as the cause of essential hypertension.

D. THE KIDNEY AS A SOURCE OF ONE OR MORE SUBSTANCES WHICH PREVENT THE DEVELOPMENT OF ELEVATED BLOOD PRESSURE

Grollman⁵⁴ has been a chief contender for the idea that the renin-hypertensin mechanism is not the cause of the elevation of blood pressure even in experimental animals with renal ischemia. He believes that renin is not produced by the normal or ischemic kidney but that it represents a product of tissue damage due to rough handling, or changes in extracts due to prolonged standing.

Grollman⁵⁵ is also responsible for the concept that elevation of blood pressure in experimental renal ischemia, as well as in hypertensive man, is due to the failure of the abnormal kidney to elaborate a substance (produced by the normal kidney) which prevents the development of hypertension. While this is an interesting point of view and one which deserves further confirmation and elucidation, there is little evidence as yet to support it.

E. ENDOCRINE CAUSES OF HYPERTENSION

Much work has been directed at determining the influence of the endocrine glands on the blood pressure. While there

is an accepted etiological relationship of pheochromocytomas of the adrenal medulla and of tumors of the adrenal cortex in so-called Cushing's syndrome to the elevation of the blood pressure, there is no well defined evidence as yet that this gland is etiologically related to essential hypertension. There is suggestive evidence that the adrenal cortex may be necessary for the development of hypertension due to renal ischemia.

There is no sound evidence that the other glands of internal secretion are in any way related to the cause of experimental or essential hypertension in man.

APPLICATION OF NEWER KNOWLEDGE TO THE TREATMENT OF HYPERTENSION

It will be the purpose of this aspect of the paper to call attention to the procedures which have been found to be of definite value and to other methods of treatment which are currently in the spot light and from which success might be expected because of the rational basis of the method.

A. THERAPEUTIC METHODS WHICH DEPEND UPON THE RENAL ORIGIN OF HYPERTENSION

1. Unilateral renal disease. It appears definitely established that unilateral kidney disease may cause hypertension. This may be due to unilateral pyelonephritis, tuberculosis, hydronephrosis, nephroptosis, tumors (Wilm's) partial thrombosis of main renal artery, etc. Unfortunately too much enthusiasm for this originally resulted in the needless sacrifice of kidneys and in some cases precipitated a rapidly fatal end. The benefits of unilateral nephrectomy or nephropexy appear to be beyond doubt. Nevertheless, the number of cases which will be benefited is very small. It is essential that a suspected candidate for such treatment be subjected to rigorous urologic examination in order to avoid mistakes. Schroeder and Fish have proposed the following criteria for the selection of patients for unilateral nephrectomy for relief of hypertension.

a. Hypertension must be of recent origin (two years or less).

b. The renal lesion must be confined to one kidney and must have produced di-

minution in the function of this kidney.

c. Combined renal function of both kidneys (urine concentration and urea clearance tests) must be within normal limits.

d. Retinitis should be absent and changes in the retinal vessels minimal.

e. The arterial blood pressure must be persistently elevated.

It is reasonable to suspect the possibility of unilateral renal disease in all cases of hypertension. But it is essential that undue enthusiasm not result in useless surgical procedures.

2. Coarctation of the aorta—surgically relieved by anastomosis.

3. Attempts to influence the humoral mechanisms involved.

Munoz and collaborators⁵⁶ have pointed out the following possibilities:

1. Suppression, diminution or inactivation of renin.

2. Inhibition of reaction between renin and hypertensinogen.

3. Diminution of the amount of hypertensinogen.

4. Inhibition of the action, or destruction, of hypertensin by an increase in the amount of activity of hypertensinase, or some other agent capable of accomplishing this. Procedures 1 and 4 have received the most attention.

Extracts of kidney were used empirically in the treatment of hypertension long before persistent hypertension was produced in animals. The first attempts to apply this method of treatment to both experimental and clinical hypertension were made by Harrison and coworkers.⁵⁷ Their use was based upon the concept that the normal kidney produced a substance capable of destroying the pressor substance elaborated by the abnormal kidney.

Page et al.^{58, 59, 60, 61} have used kidney extracts parenterally in both animals and man; and have tried to correlate its effects with the amount of hypertensinase in the extracts, which has been questioned by Schales.⁶² Harrison, Grollman and Williams⁵⁷ have also shown that hyperten-

sinase was not required for the antipressor effects of their renal extracts which they claimed to be effective in man and experimental animals given orally or intramuscularly.

Numerous investigators^{63, 64, 62} have claimed that any anti-pressor effects observed with kidney extracts are due to non-specific local and systemic effects of various organic compounds in the extracts.

The failure of these methods to result in any further progress in the number of years since they were introduced at least emphasized the difficulties involved in this type of work; and probably indicates that this approach has little to offer in the future. We still do not have anything in a small bottle that is the answer to the problem of hypertension.

Inasmuch as renin is a protein it might be expected that its repeated injection would result in the production of an antibody. In significant studies Wakerlin⁶⁵⁻⁶⁸ has demonstrated that the injection of renin from various heterologous species into the dog will prevent development of experimental hypertension, as well as lower elevated pressure in experimental animals.

In view of the fact anti-renin must be produced by injection of renin from another species, and its possible anaphylactic implications in man, this important possible approach to the problem in man has not gone forward.

The possibility of a deficiency of the heat stable fraction of vitamin B complex which Calder^{69, 70} has proposed as a cause of hypertension needs extensive confirmation.

The claims for vitamin A in the treatment of hypertension have been successfully disputed. Grollman, however, believes that various fish liver oils contain a substance, enhanced by oxidation, which may be identical with the substance previously described by him⁷¹ in renal extracts to be orally effective in hypertensive animals and man. This needs extensive confirmation, and as yet

has no application to the ordinary clinical management of hypertension. There is, as yet, no readily available source of this material.

Grollman⁷² has again revived the use of the low sodium intake as a result of some of his experimental work. He emphasizes that the sodium must be less than 1.0 gram daily. This is difficult to achieve. The significance of his observations remains to be confirmed and explained. From some of our incomplete observations, it is doubtful that this has much to offer.

The benefits of a special rice diet recommended by Kempner⁷³ in the treatment of hypertension in man has not been confirmed.

B. METHODS OF TREATMENT BASED UPON THE NEUROGENIC CONCEPT OF THE ETIOLOGY OF HYPERTENSION

One of the undisputed facts concerning hypertension is that the elevated blood pressure is due to increase in the peripheral resistance in the circulatory bed at the arteriolar level. The evidence for both the humoral renal mechanisms and the neurogenic factors have already been referred to. Most of the evidence supporting the renal origin of hypertension has been from animal experimentation, although this occurs in certain cases of renal disease in man.

The evidence supporting the neurogenic cause of hypertension is both experimental and clinical in nature, and is both negative and positive. My coworkers⁷⁴ and I have failed to find any evidence of an increase in pressor substances in the blood of patients with essential hypertension. Specifically we have failed to find any increase in the blood of hypertension (angiotonin). Dexter and Haynes⁷⁵ have likewise failed to find an increase of renin in the blood of patients who have chronic hypertension; although they have found an increase of renin in the blood of patients with acute nephritis and eclampsia. Ogden⁷⁶ has adduced evidence to indicate that rats may develop hypertension which is of renal origin, but after a

certain lapse of time appears to become neurogenic in character.

We have made extensive investigation of the effects of spinal anesthesia on the blood pressure of hypertensives and have found:

1. Marked falls in both systolic and diastolic pressures.

2. This fall occurs almost immediately.

3. In animals with renal hypertension the blood pressure does not fall for a matter of four to six hours after removal of the offending kidney.

4. During the spinal anesthetic induced fall of blood pressure in human hypertensives one may still readily cause rise in blood pressure by the intravenous injection of a number of pressor substances, including angiotonin (hypertensin).

5. There is no constant time relationship between falls in venous and arterial pressures induced by spinal anesthesia in human hypertensives.

6. The arterial pressure usually falls first—indicating that a decrease in cardiac output is probably not the cause of the decreased arterial pressure.

7. This is further supported by the fall in diastolic, as well as systolic pressures.

We believe that these and other data support the neurogenic etiology or neurogenic component of essential hypertension in man.

The neurogenic hypothesis is, of course, the rational basis for the use of the various types of sympathectomy now being employed. Of these, the Smithwick operation, which employs the supra- and sub-diaphragmatic section of sympathetics is probably the best.

One needs to urge every precaution in the rigid selection of subjects for this operation. Age, reasonably normal renal function (concentration test, urea clearance and PSP excretion tests), satisfactory cardiac function (no failure), and evidence of adequate reversibility of the blood pressure, as shown by marked spontaneous falls in pressure, and marked falls under sodium amytal sedation, and spinal anesthesia, are all important fac-

tors in selecting the candidate for the operation. In spite of rigid selection of patients, the operation is not always successful in producing a satisfactory to excellent fall in arterial pressures will have a recurrence of their hypertension within a few months to few years. The cause for this needs further elucidation.

The neurogenic concept of the cause of hypertension is also the basis for the use of such sympathicolytic substances as the tetraethylammonium compounds in the selection of patients for sympathectomy. This phase of the subject is still in the investigative stage. There is nothing which is of immediate applicability to therapy in this field.

SUMMARY

In summary the cause of "essential hypertension" remains to be defined. At this time, the renal and neurogenic mechanisms appear to offer the most fruitful directions along which further work should be done. Goldblatt has been one of the strongest proponents of the renal origin of the disease. Yet he has recently said: "In the event that the renal origin of this form of human hypertension should become established, it would still be necessary to determine the cause of the arterial and arteriolar sclerosis which, when it affects the kidneys to a sufficient degree, initiates the humoral mechanism of the hypertension."

A rational and curative treatment of the disease will, no doubt await the definition of the cause. In spite of intensive efforts of many workers for the past 15 years, the answer is not available. Continued intensive efforts must go on to the eventual solution of one of the most serious diseases with which we are confronted.

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SURGICAL TREATMENT OF HYPERTENSION*

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NEW ORLEANS

The surgical treatment of hypertension is sympathectomy by which portions of the visceral vascular bed are denervated. At the introduction of the operative treatment a wide variety of results were obtained, but with improvement in surgical technic and the clarification of the selection of patients, the therapeutic results are now becoming uniform and effective.

MODE OF ACTION

Explanations of the mechanism whereby sympathectomy lowers the blood pressure are incomplete. Some attribute it to the relief of renal ischemia, but renal denervation in a small number of human hypertensives had no effect on the blood pressure. The normal autonomy of the renal circulation, by which the kidney maintains a nearly normal rate of blood flow despite arterial pressure changes, is ignored in the renal ischemia viewpoint. Vasodilatation provides a partial explanation. However, the

reduction in blood pressure is prolonged, and in some cases progressive, after the postural effect disappears. Vasodilatation does not account for the marked regression in eye-ground changes following operation when there is no significant lowering in the blood pressure level. An additional undeveloped possibility is the effect of operation on the production of adrenalin by the adrenal cortex. Denervation of the adrenal glands in experimental animals reduces their adrenalin output; the work of Freeman, Smithwick and White indicates that sympathectomy heightens the sensitivity of the vascular musculature to adrenalin. Sufficient reduction in the supply could counterbalance the increased susceptibility.

THE OPERATION

The four surgical procedures devised vary chiefly in the extent of sympathetic denervation.

1. The subdiaphragmatic splanchnicectomy of Craig and Adson is the least extensive; it is being abandoned as incomplete.

2. Supradiaphragmatic splanchnicectomy has been carried out by Peet for the past thirteen years. He recently summarized the results of 1500 cases, the largest series by one surgeon using the same technic and with the same follow-up. Other observers have not duplicated the success of Peet. In general, the operation seems to be losing favor.

3. Transdiaphragmatic sympathectomy as performed by Smithwick is a combination of the technics of Adson and Peet. It effects complete denervation of the renal blood supply. Exposure is obtained by resection of the twelfth rib. Removal includes the greatest possible length of the splanchnic nerves and the thoraco-lumbar sympathetic trunk from T-10 to L-3 inclusive. The operation is done in two stages eight to ten days apart.

4. Total sympathectomy was first performed by Grimson in 1940. It is still considered experimental.

SELECTION OF PATIENTS

In general, the following are the criteria for operation: A patient below fifty-four years of age; a continuously elevated blood pressure, with a systolic pressure over 170

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and a diastolic pressure above 105; a non-protein nitrogen below 45 mgm. per 100 c.c.; a well compensated heart and a relatively normal cerebral function. Cardiac decompensation and recent evidence of coronary occlusion are contraindications to surgery. Gross enlargement of the heart increases the operative risk but is not in itself a contraindication.

Opinion is divided as to how much renal damage is significant. A rapidly falling urea clearance or concentrating ability constitutes an almost certain contraindication. On the other hand, if these are relatively stable over a six month period, even if the urea clearance is as low as 40 per cent of normal or the ability to concentrate is reduced to 1.018, renal damage is not a deciding factor for or against operation. Some of the best results have occurred in patients in whom pregnancy appeared to be the precipitating etiologic factor. Chronic glomerulo-nephritis is not amenable to operation. Laboratory tests, namely the sodium amyltal test and the cold pressor test, alone are not sufficient for the selection of cases. Malignant hypertension, provided the cardiac and renal damage is not far advanced, is a definite indication for sympathectomy.

RESULTS OF OPERATION

Smithwick reports a mortality of 7.8 per cent in over 600 unselected patients. Most of the deaths occurred in a small group of patients, which obviously would be considered inoperable now. Poppen had one death of coronary thrombosis in 100 selected cases.

Blood pressure reduction in 2309 cases reported is as follows: Good 45 per cent, fair 35 per cent, unsatisfactory 25 per cent. Symptomatic relief has been striking. Headache, nervousness, irritability, insomnia, and palpitation have been greatly relieved, or eliminated in 80 per cent of the patients. The improvement has been persistent and is not necessarily dependent on a significant lowering of blood pressure.

Renal function has shown definite improvement in 40 per cent of cases. Half of the patients with marked cardiac enlargement underwent a significant reduction.

Fundiscopic findings have regressed in 80 per cent. Nineteen per cent of Peet's patients with preoperative malignant hypertension are still living five to thirteen years after splanchnicectomy. A number of patients with severe hypertension have carried pregnancy to completion without incident subsequent to operation. In males, libido and potency are diminished in 23 per cent. Twenty-one per cent had no ejaculation postoperatively. All indications point towards an increase in life expectancy with a more comfortable existence, but many more years of careful follow-up are necessary to verify this.

COMMENT

The experience of the author, which is limited to 19 cases, coincides with the results reported. In addition, it was noted that most of the patients experience a period of mental depression which varies from six months to a year. A troublesome neuritis plagues most of them for four to six months.

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THE USE OF DRUGS IN THE TREATMENT OF HYPERTENSION

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NEW ORLEANS

There is no adequate drug therapy of hypertension. In the past a multitude of drugs have been proposed for their hypotensive effect, but these have largely been discarded as of no value. In recent years in accord with our changing concept of hypertension attempts at more specific therapy have been made with agents acting on a theoretical renal origin of the hypertension. None of these agents has so far been successful. Thus as it stands

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Today one might summarize the present status of drugs in the management of hypertension by stating that, except for the symptomatic relief of sedatives and analgesics as adjuvants to psychotherapy (and perhaps thiocyanates), drugs have little place in the modern care of the hypertensive. While such a statement would summarize the more scientific attitude it would be far removed from the every day practice of medicine, where most of us are still using the older groups of drugs in the management of our patients.

NITRITES AND XANTHINES

Thus the nitrites whose action is evanescent and generally conceded to be of no value except in the anginal syndrome and coronary insufficiency, are still widely used in attempts to lower the blood pressure. Likewise, the xanthines, whose hypotensive qualities are nil, still enjoy wide popularity. The various salts of theobromine and theophylline, almost always in combination with phenobarbital, are commonly prescribed. That they might possibly be useful in cardinals is felt by some; that they do not lower the blood pressure is admitted by all. Why then do they continue to enjoy such popularity? It must be because they are more or less harmless, agreeable to take, and because many of us feel that we must give "some medicine" to the patient. Further, it may be argued that it is a satisfactory but expensive way of giving phenobarbital to certain patients, who for one reason or another object to the barbiturates.

THIOCYANATES

Interest in the use of the thiocyanates revived greatly in the past ten years with the advent of methods of blood level control. That they are poisons and should be used only in certain selected cases under rigid blood level control should be well known. That they lower the blood pressure in roughly 50 per cent of the cases without any consistent relationship to the dosage used is agreed. That they relieve symptoms, mainly and notably troublesome headache, is generally conceded.

Those who advocate their use advise strongly against exceeding blood levels of 6-12 mgs per cent, and recommend the lowest level that will relieve symptoms. Some feel that the thiocyanates are the only worthwhile drugs available in controlling symptomatic hypertension. On the other hand there are those who do not advise their use under any circumstances, considering them ineffective and dangerous even with blood level control. Their toxic manifestations are legion and include nausea, vomiting, muscular fatigue, dermatitis, goitre, thrombophlebitis, mental confusion, lethargy, delusions, hallucinations of sight and hearing, motor aphasia, delirium, convulsions, coma, and death. Seven deaths are reported as positively due to their use. It is questionable whether we will ever know just how many hypertensives have died from thiocyanate. It is probable that they are used more often uncontrolled than controlled. One wonders whether the interest aroused in them in the past ten years represents but a desperation measure, and that their use will disappear from medical practice in years to come. At the present time however, such a measure seems justified only when symptomatic control cannot be had by less noxious agents. As far as I have been able to determine their use has not appreciably prolonged life.

IODIDES

The iodides are likewise still widely used in the management of hypertension. Their use seems to be predicated on the old belief that they have some hypotensive value, and that they act as tissue resorptives, and are especially taken up by necrotic or degenerative tissue and aid in the dissolution of such tissue. While there is no scientific evidence to show that they have a beneficial effect in hypertension, there is likewise no evidence to show that they have a deleterious effect.

HORMONES

Estrogens, frequently in conjunction with thyroid extract, are useful in some patients in the menopausal age who exhibit emotional instability. They should

be tried on all such patients if the symptoms are not controlled by sedation and psychotherapy. It is the consensus of opinion that what beneficial effect they have on the hypertension is directly proportional to the extent to which they relieve the emotional instability. It has been shown that the term menopausal hypertension is a misnomer, and that it is merely essential hypertension accentuated by the menopause.

While the results with the use of testosterone in the male have been dubious, it is generally felt that testosterone is worth trying, particularly in cases presenting the picture of the male climacterium. Such cases however are not common.

The use of pitressin tannate in oil in selected cases of hypertension fulfilling certain diagnostic criteria has been reported. About 50 per cent of the cases so treated are said to have moderate reduction of blood pressure and alleviation of symptoms. Irradiation of the pituitary in the same type of cases gives about the same results.

VITAMIN A

Competent reports on the use of vitamin A indicate that in doses up to 400,000 units a day it is ineffective in reducing the blood pressure. It does however increase renal blood flow, filtration rate and maximal tubular excretory capacity in hypertensive patients. It is believed that there is some other substance present in fish liver oils that accounts for the renal changes observed. The Russians describe a "fragment" of vitamin A which they call "Cytral" that is supposed to lower the blood pressure and relieve symptoms in ten to fourteen days. Cytral is described as a yellow oily liquid obtained from the seeds of coriandrum, a plant of the umbrella family. Further confirmation of the merits and availability of this substance is needed.

MISCELLANEOUS SUBSTANCES

Next, there is a large group of substances proposed at one time or another for their supposed hypotensive qualities

which either have been discarded as of no value or have not as yet been shown to be of real value. Among those which have been discarded as of no value are: Extract of garlic and parsley, extract of watermelon seed, extract of mistletoe, calcium salts with or without atropine, liver extract, pancreatic extract, foreign protein, benzyl benzoate, radium chloride, etc.

More recently certain thiourea compounds have been suggested but no extensive work has been done with them as yet. It is not likely that they will prove useful in uncomplicated essential hypertension, however.

Salsolin, a drug derived from a plant found in the Southern Siberian desert and reported by the Russians for its hypotensive qualities and ability to relieve symptoms, was referred to last year in the American literature but I know of no controlled reports of its usefulness.

Beneficial results from the use of prostigmin orally in doses ranging from 7.5 to 22.5 mgs., three times daily, have been reported from Germany. The use of this parasympathetic drug is based on the finding of an increase in serum cholinesterase in essential hypertension. This work has not been confirmed.

Rutin, the drug only recently publicized in the lay journals, is said to lower blood pressure in some hypertensives that show increased capillary fragility. According to one reporter, about 20 per cent of the hypertensives show increased fragility by the Gothlin Index. In those over the age of forty the drug is said to be useful in preventing vascular accidents; in those under the age of forty, in addition to correcting the increased fragility it is said to frequently return the blood pressure to normal. Again, I have not seen adequate confirmation of these claims. The drug, however, is apparently entirely non-toxic, and has been used in conjunction with thiocyanate therapy to correct or prevent the increase in capillary fragility that sometimes occurs from the use of thiocyanate.

At the present time there are under

investigation various tetraethylammonium compounds whose hypotensive effect is said to be marked but transient, and whose action is on the autonomic ganglia. These drugs are being studied mainly in connection with peripheral vascular disease, and it would be out of order to do more than mention them here.

SO-CALLED SPECIFIC MEDICAL THERAPY

Finally, a few words about the so-called specific medical treatment of hypertension, wherein the substances used are directed at a theoretical renal origin of the hypertension. Such substances are renal extracts, tyrosinase, methylene blue, and the quinones. Each of these substances is directed at the neutralization, inactivation, or inhibition of renal pressor substances, either at their site of origin in the kidneys or while circulating in the blood stream. Suffice it to say that thus far reports from various research groups have shown them to be ineffective in human hypertension.

CONCLUSION

Thus it would appear that from the standpoint of drug therapy, we have little that is formidable to offer the patient with essential hypertension. The plan that has been effective and safe is the alternation of the use of various quieting agents such as phenobarbital, bromide, and chloral hydrate, along with psychotherapy and dietary restriction when indicated. Various analgesics are used as needed. Thiocyanate is recommended only exceptionally. Any such plan frequently depends for its success as much on the personality of the doctor as on the drugs used.

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DISCUSSIONS

Dr. Edgar Hull: I think the completeness with which these men have covered the subject is indicated by the fact that they have already asked and answered most of these questions which have been submitted.

One question is, what about the Kempner rice and fruit juice diet for hypertension? I think Dr. Gregory answered this during his paper. Do you have any further comment?

Dr. Raymond L. Gregory: I simply summarized the status of present knowledge by saying that, in general, there has been almost complete inability on the part of other people to confirm the beneficial effects of the rice diet which has been recommended by Kempner. You recall that the original basis for the use of this diet was the idea that the abnormal kidney elaborated, from ordinary dietary sources, a substance or substances which was the pressor substance responsible for the elevation of the blood pressure; and that perhaps some other food, in his instance he believed rice, did not contain precursors from which this pressor substance could be elaborated. That is the original basis for it and I might say the question yet remains to be adequately studied. Most of the observers who have tried it realize that most of the difficulty is to get the patient to stay on it any length of time. It is extremely undesirable, to say the least in that it is so unpalatable that the patients do not wish to persist in its use. I think we should emphasize that as yet no real value has been shown from this method of managing hypertension.

Dr. Hull: Another question is—Is salt restriction of any value in treatment of hypertension?

Dr. Gregory: I personally don't think it of any value whatsoever. If I may be permitted, rather than elaborate on that point, I would like to make another point in connection with hypertension. It is this: It is extremely difficult to run a good control on the effect of any substance, drug or otherwise, or any procedure to decrease elevated blood pressure. I am sure there is not an individual among you who has not seen many hypertensives whose disease is characterized by extreme fluctuations of blood pressure. It is not at all uncommon to find a patient with blood pressures for a day a week of 220, 230 or 240 with diastolic levels of 130 or 140. Then for no apparent reason that one can detect—perhaps slight decrease in activities—or perhaps not particularly related to these restricted activities—no changes in their regime at all—one finds blood pressures around 160 or 180. When you have that type of natural fluctuation of levels of blood pressure it is obviously difficult to appraise the value of any therapeutic method. I think most

of the useless methods employed are the result of failure to consider seriously this important fact in dealing with the hypertensive patient. I am quite sure this is the case with the rice diet and low sodium intake as well.

Dr. Hull: The next question Dr. St. Martin answered, by implication if not directly. It is this—Is it reasonably safe to give thiocyanates without determining the blood level from time to time?

Dr. M. E. St. Martin: I think this question has been suitably answered. Personally, I am very much against the use of thiocyanates. If they are going to be used at all they certainly should have frequent blood level control; in the beginning—at least once a week and after an effective safe level has been established, at least once a month. That is the generally recommended method of doing it but I don't like them under any circumstances.

Dr. Hull: The next question, we will refer to Dr. O'Neil: Does the previous occurrence of congestive heart failure, myocardial infarction, or cerebral vascular accident necessarily contraindicate sympathectomy for hypertensive disease?

Dr. L. J. O'Neil: I would say, if the patient is young, if he is completely recovered, if compensated and if you thought he could stand the operation, then sympathectomy would be indicated. If over 50 years of age, no. All the writers and operators mentioned have exceptions to their rules. For example, Peet had one elderly patient who developed sudden blindness. Obviously such a patient with severe hypertension would not be considered a good risk. Operation was advised and restoration of sight resulted. It really boils down to the evaluation of the patient. The one who sees the patient daily is in a better position to say than all of these tests and if I did not clarify that in the talk I would like to bring it out now; the application of all these tests but not only one test decides whether or not a patient is to be operated on.

Dr. Hull: The next question we will refer to Dr. Gregory. Is unilateral kidney disease of sufficient importance in the cause of hypertension to warrant a urologic survey, including at least an intravenous pyelogram, in the work-up of all cases?

Dr. Gregory: Here again, this question is hard to answer. Certainly it is impossible, I believe, whether warranted or not, for every hypertensive patient, to have a thorough urologic study from the standpoint of ruling out unilateral renal disease. The number of these people reaches such great proportions that the facilities available would not permit. In general, the answer to this question would depend upon a careful clinical evaluation, the importance in the history of symptoms of urologic nature such as previous pyuria, renal lesions which suggest those abnormalities

or suggest nephroptosis with elevation of pressure in the upright and not in the recumbent position which is emphasized by McCann and others. A good clinical history which would rule out any suspicion of renal disease is, I think, adequate evidence against the routine use of urologic studies in every patient with hypertension. If, in addition to the absence of suspicious evidence of current or previously active renal infections on the basis of good history and at least a careful urinalysis, there is a good or strong family history of hypertension, as one can usually obtain it in most of the people with so-called essential hypertension, I would say you would have enough evidence to obviate the necessity for urologic studies in the vast majority of cases with hypertension. That is the way I would and do approach the answer to this question.

Dr. Hull: The next several questions on the list have already been answered so we won't repeat. I do have one final question presented to me and known technically as a "stinker". It is this—Do you believe that *any* treatment really alters the course of hypertensive disease? I would like to have volunteers to answer that question.

Dr. Gregory: The reason I am willing to take a chance at this question is because behind it there are implications which are important in handling the patient with hypertension. I don't know that we have conclusive evidence that any type of medical treatment alters the course of hypertensive disease. We would have to define the term before answering that question. If you mean prolong the life of the patient; I think, by inference, we have to say that the individual who gets good results from sympathetic surgery does have a prolongation of life at least to the extent to which his blood pressure is reduced for a long period of time. That is the natural corollary I think we all accept, namely, carrying of elevated blood pressure for long periods of time is harmful. Many of these people have marked increase in comfort during the time they do live. I think that is important. Other than sympathectomy I am convinced in my own mind that it is unlikely that any form of therapy we indulge in really alters the course of hypertensive disease at the present time. Here is the much more important consideration behind this question to me. Although what I say I believe thoroughly, nonetheless we can't take a completely defeatist attitude toward it. Thousands of people with hypertension come to doctors' offices. If one takes this defeatist attitude, I think it does a great deal of harm. There are many things we can and must do in the management of hypertension. Not among the least is the acquisition of sufficient knowledge of the natural history of this disease to enable the physician to avoid doing harm. I believe a large proportion of patients I see with hypertension, are not ill by reason of hypertension but primarily ill as a result of the

anxiety state which the knowledge of their disease, or undue restrictions have engendered in the patient. It is absolutely essential that we approach this thing reasonably and do everything we can to avoid having these people make their lives revolve around their blood pressure. It is just as well perhaps in the average case, when one has become convinced that hypertension is established to throw away your monometer. There are many attitudes which one can take toward management of hypertension which are, in a sense, types of psychotherapy in which I believe. We must not "brush them off" and develop a hopeless attitude that nothing can be done; and it is just a matter of time before death or serious complication will arise. We all know that the average case of hypertension exists 20-40 years before serious consequences arise.

Dr. A. A. Herold: I would like to ask one of the essayists a question—Do you consider daily physical rest of value to the hypertensive insofar as comfort and longevity are concerned?

Dr. St. Martin: It has been definitely shown that in the recumbent position the blood pressure is almost invariably lower. I feel that such a program of daily rest is a wise one, provided the patient is in a reasonable position to do so, to split his day and rest for a half hour at least. It does not have to be a two hour afternoon rest. Even ten or fifteen minutes would be satisfactory—if he broke his day and got some relaxation during that time. I definitely think it is beneficial and that treatment comes under the heading of psychotherapy. It includes all those things considered in daily life. All those things you would do in order to obviate any possible emotional stimulus to the patient and focus his attention on his blood pressure.

Dr. Hull: The time is up and we will draw this symposium to a close. I wish to take this opportunity to thank the three essayists for the excellent manner in which they have presented the subject.

SYMPOSIUM ON EYE, EAR, NOSE
AND THROAT
WHAT IS NEW IN OPHTHALMOLOGY
CHARLES A. BAHN, M. D.

NEW ORLEANS

Medical progress means change. Change means experimentation. Innumerable current ophthalmic experiments are in different stages of evolution and include the practical and the impractical, the wise and the otherwise. Most of them have potential value but they also have specific limitations

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and contraindications. In this very brief review, a few of these experiments have been selected because of their interest to the general physician. I hope their presentation will be of service to him in advising patients concerning ophthalmic problems.

GLAUCOMA

After 60 years of research, glaucoma continues to be ophthalmology's public enemy number one. The principal reasons are: (1) glaucomatous patients do not receive efficient treatment early enough and do not continue it long enough; (2) we ophthalmologists are not always able to apply our technical knowledge of the disease to the individual needs of each glaucomatous patient.

Among the newer drugs now being experimentally used in the local treatment, especially of primary glaucoma, is D.F.P. (diisopropyl fluorophosphate). It is employed preferably as 0.1 per cent solution in peanut oil. Being much stronger than other miotics now in use, its instillation is followed by blurred vision from accommodative spasm and occasionally by headache. D.F.P. is used only as infrequently as possible and with supplementary ocular or extra-ocular treatment, if necessary, to maintain minimal ocular hypertension. During a seven month period, I have used it on 15 patients with advanced primary glaucoma whose tension could not be controlled by miotic treatment and who were poor surgical risks. In 12, the tension has been normalized. In three patients, supplementary treatment was necessary.

Operation alone does not completely cure glaucoma because the attendant intra-ocular degeneration remains unchanged. Cyclodialysis and iris inclusion operations are more generally employed in narrow angle glaucomas, and sclerectomies in wide angle glaucomas. Psychotherapy is rapidly and rightly becoming an important adjunct to other treatment in the care of the glaucomatous. Fear, worry, mental tension and other emotional disturbances aggravate or precipitate glaucoma in the predisposed. Their attendant diencephalic irritability can usually be materially reduced and their intra-ocular tension kept lower by learning

to live calmly. For the glaucomatous emotional binges spell blindness. If they wish to live dangerously, they must also be prepared to die potentially sightless.

Primary glaucoma is essentially a bilateral constitutional degenerative disease in which corneo-scleral filterability and intra-ocular vascular permeability are both involved in varying proportions. If the former is dominant the corneo-scleral angle is usually larger and vice versa. The intra-ocular vascular degeneration is part of a similar bodily process which, in the diencephalic centers, sensitizes the predisposed glaucomatous eye to emotional stimuli.

Generally speaking, as long as ocular tension can be normalized and central and peripheral vision stabilized by non-surgical treatment, the immediate and later risks of glaucoma operations are not justified.

CATARACT

The treatment of primary senile cataract continues to be lens removal. No radical changes in its technic have been widely adopted during the past two decades. Retrobulbar anesthesia, akinesia, superior rectus suture, keratome incisions enlarged with scissors, and the use of multiple sutures indicates the present trend to increase safety, but with increased complexity.

Intracapsular extraction, if successful, has the advantages of more rapid recovery and less secondary surgery. Its disadvantages include: a more difficult technic, a more limited field of usefulness, and an increased frequency of serious complications, including vitreous loss and retinal detachment.

Generally speaking, two cataract dicta of a generation ago require little revision. These are: that the time for operation begins when vision in the best seeing eye is about 20/70, and that operation on the first mature cataractous eye is a necessity, but operation on the second eye is a luxury.

CAVEAT EMPTOR

It is unfortunate that the popular press feels little responsibility for those who are exploited by reading too literally its overdramatized and often distorted pictures of medical progress. If the visually handicapped understood as fully as they should

the specific indications, limitations and other disadvantages of contact glasses, corneal transplants, and eye exercises as aids to visual improvement, fewer would be employed.

For those who require heavy lenses, contact glasses during a few hours daily may be a reasonable substitute. They may be of use in vocations requiring protection such as high diving and football. In the entertainment profession they facilitate facial character expression and they may be of value to those with optically imperfect corneas. The initial cost in time, money and effort, the usually long period of adaptation, the few hours daily which they can be worn with comfort, and other disadvantages largely counterbalance their advantages even for those who violently dislike ordinary spectacle lenses.

Corneal transplantation is not a new procedure and its technic has not been materially changed during the past 20 years. Elschmig's results during the early 1920's were equal to any I have seen since. It is an old procedure with recent over-dramatization. We ophthalmologists hope that a new organization, the Eye Bank, will be of service in reducing the mortality of eyes operated upon by corneal transplantation and legitimatizing its use.

Two independent groups of ophthalmologists at Johns Hopkins and St. Louis University have proved that eye exercises are no substitute for the need of proper correcting lenses. Correcting lenses place before the eye the focusing power which the eye lacks. The focal power of the eye depends primarily upon its length and index of refraction, which obviously cannot be changed by rolling the eyes in one direction or another. The cost in time, money and effort of eye exercises as a substitute for glasses is not justified by the permanent results they afford.

Eye exercises do have a more legitimate field in facilitating the use of both eyes as a unit, especially in younger persons. In this training, the respective stages are: (1) the development of reasonable vision in each eye separately; (2) conscious fix-

ation by each eye separately; (3) binocular fixation with stereopsis, if possible. In reading some of the popular books on eye exercises one is again reminded that credulity and audacity are without limits.

Popular fads in ophthalmology come and go. Like the story of Robinson Crusoe, they usually are based on 5 per cent fact and 95 per cent fancy. There are few proven cases on record in which sight has been improved by the ingestion of vitamins alone. The psychic highball has its legitimate and illegitimate use in the care of the visually sick. Vitamin therapy in ophthalmic practice except in a few specific conditions is largely just another form of psychic highball.

ANTI-BIOTICS

In ophthalmology, the sulfa drugs are most effectively employed in acute external focal infections due to specific organisms which include the coccal group and the virus of trachoma. Intra-ocular infections transmitted through the blood stream are less influenced by sulfa and penicillin treatment. Generally speaking, the ocular indications for penicillin and sulfa therapy are approximately the same, though the former is preferred in the more acute and severe infections, and the latter in the less severe. Both are frequently used at the same time. Locally, the sulfa drugs are most frequently employed as a 5 per cent sulfathiazole ointment and a 30 per cent sulfacetimide solution. The former has the advantage of longer contact. Ocular allergic reactions to the sulfa drugs are relatively infrequent as contrasted with local penicillin therapy. For this reason, use of penicillin ointment and drops is being largely discontinued in ophthalmology. The most efficient ocular use of penicillin in subconjunctivally, 2000 U per c.c. As a dusting powder in infected wounds, and injected intra-ocularly the reports of its success and failure are conflicting.

The use of streptomycin in ophthalmic practice is so limited that its specific indications, limitations, and contraindications cannot yet be evaluated.

ALLERGY

The increasing importance of the allergic

factor in the causation, progress, and treatment of phlyctenular and follicular conjunctivitis, interstitial keratitis, non-granulomatous uveitis, and numerous other ocular inflammations is only now being generally recognized. In ophthalmic practice allergic desensitization is not in general use. Of the newer antihistaminic drugs, diphenhydramine hydrochloride (benadryl hydrochloride) and tripeleminamine hydrochloride (pyribenzamine hydrochloride) are being experimentally used especially in non-granulomatous uveitis and vernal conjunctivitis respectively. In two personal cases of acute uveitis with a dominant allergic factor, benadryl apparently did not effect the eye, but had to be discontinued because of its side reactions in the digestive and nervous systems. Its specific value, indications, and limitations have not yet been determined. Lacrimation, itching, and photophobia in vernal conjunctivitis are frequently reduced after pyribenzamine therapy, but the structural appearance of the ocular tissues is not changed.

MILITARY OPHTHALMOLOGY

Civilian ophthalmology is indebted to military ophthalmology for a better understanding of the indications and limitations of numerous procedures. The Berman and other localizing devices have been both favorably and unfavorably commented upon as practical aids in reducing ocular trauma and increasing efficiency in the removal of especially magnetic intra-ocular foreign bodies. The routine diathermic sealing of scleral wounds to reduce subsequent retinal detachment will probably be more widely used. Undue haste in performing major operations even on injured eyes containing foreign bodies may increase the attendant risks. The time required for other necessary procedures such as localizing plates prior to operation seldom determines the fate of an eye. None of the recent substances which have been proposed for ocular implants including tantalum and the acrylic resins have any apparent superiority, nor have the different shapes suggested been shown superior to those previously in use.

MISCELLANEOUS

A new application of the basic concept expressed in the Biblical parable concerning the sower and the seed will, in my opinion, greatly influence medical thought in the next decade. Constitution (the seed), environment (the soil), and time together in varying proportions form a three-dimensional concept which more fully explains the causation and progress of practically all visual disease than does our present one all-inclusive causative conception.

The future of new medical ideas and experiments like that of unborn infants is difficult to predict. Most experiments that have become important factors in medical progress are basically only new and more efficient applications of previously known fundamentals which have been adapted to popular needs. Among the interesting and more technical ophthalmic experiments which may play a more or less important part in ophthalmic progress are: (1) the Filatov treatment of retinitis pigmentosa which includes the intramuscular injection of cod liver oil and tissue implantation; (2) tracer isotopes which may become of practical value diagnostically and therapeutically especially in neoplastic diseases; (3) air injection into the anterior chamber in glaucoma surgery to facilitate filtration; (4) rutin ingestion to reduce capillary and intra-ocular hemorrhage associated with capillary fragility and hypertension; (5) heparin injection in the treatment of intra-ocular vascular thrombosis, the use of which is not without risk; (6) x-ray and radium in the treatment of intra-ocular degenerative diseases and in the reduction of vascularity in cicatrizing diseases of the anterior eyeball.

CONCLUSION

Each of us in our own way is daily contributing to medical progress by using and evaluating more or less experimentally, concepts, remedies, and procedures which have been conceived by ourselves or others. Five years are usually required to evaluate reasonably the specific indications, limitations, and perhaps more important—the contra-indications of new remedies, concepts or

procedures. In our efforts to shorten this more experimental period and to find newer and better methods, we must never lose sight of the Golden Rule and its inescapable responsibilities.

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MALIGNANT TUMORS OF THE NASOPHARYNX

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NEW ORLEANS

The nasopharynx, although not the most frequent, is one of the most serious sites of malignant growth in the upper respiratory and alimentary tracts. The main reason for this is the lack of early symptoms and consequently early diagnosis, and the characteristic early metastasis before the primary growth has reached proportions capable of producing symptoms. The later symptoms of metastasis may so overshadow the primary tumor that many patients probably die of widely disseminated cancer with the actual site of the primary lesion in the nasopharynx unsuspected.

Cancer in the nasopharynx occurs most

often on the posterior wall, in the region of the nasopharyngeal tonsil, and next in frequency on the lateral walls, on the ridge which surrounds the orifice of the eustachian tube. Occasionally, a growth may arise somewhat lower on the posterior wall near the junction of the nasal and oral pharynx. The upper surface of the soft palate and the posterior edge of the septum practically never give rise to cancer.

Cancer of the nasopharynx is much more common than reports in the literature indicate. This is because unfortunately so many cases of nasopharyngeal cancer are included with growths of the nasal cavity and of the pharynx as a whole. In statistics of carcinoma of the head and neck the average incidence of cancer of the nasopharynx is about 2 per cent.

Nasopharyngeal carcinoma usually occurs at an early age, being found more often in children and at ages below 30 than any other malignant growth of the upper respiratory and alimentary tracts. The average age is between 40 and 45 years as compared to 56-60 years for cancer of the tongue, cheek, tonsil and larynx. The average for this lesion in the army was 32 years but the age group was limited, ranging from 20 to 45 years. This is in direct comparison to that of civilian practice in that malignancies of the tongue, cheek, tonsil and larynx averaged 40 to 42 years.

Nasopharyngeal carcinoma is predominantly a disease of the male, about 80 per cent or more occurring in this sex. I can recall seeing no cases among the United States Woman's Auxiliary Corps during World War II. All cases seen during military service were among soldiers, and in civilian practice the incidence is nine to one in favor of the males.

Since cancer of the nasopharynx arises most commonly at the site of the pharyngeal tonsil, it is natural that highly anaplastic epidermoid carcinomas and lymphosarcomas should make up the largest proportion of the total. Some salivary glands are present in the mucous membrane lining the lateral and posterior walls of the

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nasopharynx, so that adenocarcinoma does occur but is rare.

There is considerable disagreement as to the histologic terminology. It is generally agreed that epidermoid carcinomas make up the largest proportion of nasopharyngeal tumors. The designation of other groups is rather confusing in its varied terminology. Of the epidermoid types the predominant are transitional cell and lympho-epithelioma. Some squamous cell and some spindle cell carcinomas also occur but these are in the minority.

SYMPTOMS AND SIGNS

The development of the primary tumor produces nasal obstruction, epistaxis, nasal discharge, chronic sore throat, postnasal pain, dysphagia, sensation of a lump in the throat and nasal speech. The manifestations of the disease which first bring the patient to a physician are more often those due to secondary extension. The reason for this is that the nasopharynx is a cavity of rigid wall, which, as a part of the respiratory tract, is much wider than the nasal cavities in front or the glottis below. Obstruction in breathing will not occur, therefore, except in the later stages when the tumor has become large and bulky and usually after metastasis has taken place. No other function can be disturbed early in the course of the disease unless the growth arises near or in the orifice of the eustachian tube, so as to cause partial deafness by obstruction.

The most frequent symptoms reported are nasal obstruction or discharge, headache or local pain and defective hearing or pain in the ear. Nasal obstruction is a primary symptom in from 20 to 30 per cent of cases. Only slightly less often does the patient have a nasal or postnasal discharge, which is usually bloody. Hemorrhage is rare but may occur when an attempt is made to clear the nasal passages by blowing the nose. Symptoms referable to the ear occur in about 10 per cent of cases in the early stages of the disease and consist of persistent, progressive unilateral deafness and occasionally pain in the ear. As a later symptom or as a complication following irradiation, disturbances in hear-

ing are common. However, because of the location of the tumor on the posterior or lateral wall, these symptoms are usually associated with some degree of metastasis since the growth of necessity must reach fair proportions and by this time glands have usually appeared.

One of the most characteristic features of the later stage of the disease is its tendency toward direct extension intracranially and intra-orbitally. Intracranial invasion occurs in one of two ways: either from the fossa of Rosenmuller which lies directly under the mesial portion of the foramen lacerum a distance of about 1 cm., or by direct erosion of bone. In addition to local pain the symptoms of intracranial invasion are those of progressive unilateral paralysis of the cranial nerves in about the following order: sixth, third, fourth, fifth, seventh and second. Involvement of the other cranial nerves is seldom seen but may occur as the growth gradually advances. In nearly all the later cases there is some erosion of bone and in about one-third of the cases with metastasis there is also involvement of the sphenoid. However, once the cranial cavity has been invaded, the growth tends to remain extradural, which means the periosteum is separated from the bone and erosion is the result rather than the cause of intracranial extension.

As the growth invades the foramen lacerum, the sixth nerve, which lies directly over the foramen, is nearer and therefore becomes involved first. The third, fourth and fifth cranial nerves lie next in proximity, just above the sixth and are naturally involved in that order of frequency.

Intra-orbital extension of the growth occurs by way of the foramen lacerum, the carotid groove and the superior orbital fissure. Invasion of the orbit results in exophthalmos, ophthalmoplegia and eventually blindness. In a few cases exophthalmos is one of the first signs, which is evidence of the asymptomatic course of the disease.

Cervical metastasis is present in about 80 per cent or more of cases because of the tendency to early metastasis even when the growth in the nasopharynx is small and of

recent onset. This is the only finding on admission in over half of the cases and it usually has been present for an average of six to eight months. Most frequently involved are the upper deep cervical lymph nodes lying just below the tip of the mastoid under the upper end of the sternomastoid muscle. Next are those over the carotid bulb. After invasion of the upper deep cervical nodes, metastasis extends to the lower portions of the neck with more frequent involvement of the posterior chain in the posterior triangle than occurs in cancer of the oral cavity itself. The submaxillary and submental nodes are rarely involved in early metastasis. Widespread bilateral cervical lymphadenopathy is characteristic of the later stages of the disease.

The presence of metastasis on admission is one of the most important factors in prognosis. Intracranial invasion and involvement of the cranial nerves or orbit, universally gives a poor prognosis. If cervical metastasis has occurred only in the upper portion of the deep cervical nodes, the prognosis is fair; if the nodes of the posterior triangle or lower cervical chain are involved, the prognosis is poor. Like cancer elsewhere, a favorable prognosis requires recognition of the growth before the glands have become involved. Even in those patients treated extensively, in whom the primary site and even metastasis of the cervical glands have disappeared, if the lower cervical chain is involved, the growth is prone to recur in the chest, long bones or viscera. Even if treated and the chest becomes clear radiologically, the growth will reappear in some other area for by this time it has become disseminated.

DIAGNOSIS

The diagnosis of cancer of the nasopharynx is easy to substantiate because this area is readily accessible and yet there is probably no other form of cancer in which the diagnosis is more often delayed or entirely overlooked. This may be partly explained by the fact that in only about 50 per cent of cases are there any early local symptoms from the primary lesion. For this reason an average of eight months

elapses between the onset of symptoms and a correct diagnosis whereas the average time from onset to metastasis is about six months.

Except for cancer the nasopharynx is relatively unimportant from the standpoint of disease and is the most overlooked area in routine physical examinations. It may be visualized by the nasopharyngoscope or even better by the use of a throat mirror in the pharynx, the examiner depressing the tongue and retracting the free edge of the soft palate forward. There are irregularities in contour of the mucosa on the posterior wall and a lesion in the early stages may readily be overlooked. A biopsy should be obtained of any suspicious area or ulceration and one negative biopsy does not rule out the presence of malignancy. Frequently, several biopsies are necessary before a positive diagnosis can be made. This cannot be too firmly stressed because it is in this early stage that the prognosis is most favorable.

TREATMENT

The treatment of choice is radiation, for nasopharyngeal cancer is one of the most radiosensitive of all tumors of the upper respiratory tract. Furthermore, this area tolerates heavy doses of radiation more satisfactorily than other adjacent areas such as the hypopharynx. Because cervical metastasis is highly prevalent in these cases, their successful treatment is important from a prognostic standpoint. Even in widely disseminated metastasis palliative treatment is distinctly worth-while because of the radiosensitivity of the growth. The severe pains produced by metastasis to the long bones, pelvis or spine can frequently be completely relieved by moderate doses of external radiation. Likewise, metastasis in the liver or other viscera may be rendered temporarily asymptomatic.

SUMMARY

Malignancy of the nasopharynx comprises about 2 per cent of malignant growths of the head and neck. The disease is characterized by early metastasis and because it is asymptomatic in the early stages, it is frequently overlooked until metastasis has occurred. Irradiation is the treatment

of choice because of the extreme radiosensitivity of this type of tumor. The prognosis is poor except in the early stages and even in the early stages it is less favorable than it is for the early cases in other parts of the body.

MÉNIÈRE'S DISEASE; ITS TREATMENT

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True Ménière's disease is now classified as endolymphatic hydrops. Cawthorne and Hallpike¹ demonstrated that in true Ménière's disease there is retained endolymphatic fluid and dilatation of the endolymphatic system, particularly the scala cochlea. The cause of this endolymphatic hydrops remains in the realm of theory. The attacks of Ménière's disease are believed to be produced by the sudden escape of this retained endolymphatic fluid, which explains the nature of the attacks—the sudden, severe, true whirling vertigo with nystagmus, nausea, vomiting, and falling. The prolonged retention of this endolymphatic fluid and the dilatation of the scala cochlea produce the variable tinnitus and the eventual nerve deafness.

The goal of the medical treatment of Ménière's disease is to reduce the quantity of retained endolymphatic fluid. The Furstenburg regimen (salt free diet and ammonium chloride) has been of proved value in this respect. Histamine and nicotinic acid have been greatly exploited as symptomatic treatment for all types of vertigo. They may yet prove to be of value by altering the capillary permeability in true Ménière's disease. I prefer the Furstenburg regimen with a low constant fluid intake.

Regardless of the type of conservative treatment used, benefit is obtained in 70 to 85 per cent of cases.

There always remains a smaller percentage of patients who do not respond to

conservative treatment and who are incapacitated by the attacks. These patients may be cured surgically. Since 1940, destruction of the labyrinth, the end-organ which produces the vertigo, has replaced the more formidable neurosurgical section of the vestibular portion of the eighth nerve. Destruction of the labyrinth is one of the simplest otologic operations. An antrostomy is performed and a small window is made in the horizontal semicircular canal. Through this window the labyrinth is destroyed by electrocoagulation² or avulsion.³

Eight patients with severe and incapacitating Ménière's disease (hydrops of the endolymph) of from one to eighteen years' duration who failed to respond to any known medical treatment have been treated by electrocoagulation of the labyrinth. In the uncomplicated cases (table I) the pa-

ELECTROCOAGULATION OF LABYRINTH FOR MÉNIÈRE'S DISEASE (8 CASES)

Case	Sex	Age	Duration of disease Yr.	P. O. Period of rehabilitation
1	F	27	1.5	3 months
2	F	31	3	Improved; hydrops of opposite labyrinth has developed
3	M	41	1	6 months
4	M	42	3.5	6 months (psychoneurosis)
5	F	48	8	3 weeks
6	F	32	3.5	1 month
7	F	62	4.5	3 months
8	F	57	18	Convalescing

All patients except case 2, who were formerly incapacitated by recurrent attacks of vertigo, are now able to lead normal lives. They have varying degrees of imbalance, more noticeable at night, but this does not interfere with their occupation.

tients have been able to resume their occupations relieved of the severe vertiginous attacks. These patients still have varying degrees of unsteadiness, which is more noticeable at night but does not interfere with their living normal lives. Their preoperative nerve deafness is now complete.

CONCLUSIONS

1. Ménière's disease (endolymphatic hydrops) is primarily a medical disease.

2. Surgical treatment is indicated when the vertigo fails to respond to prolonged medical treatment.

3. Destruction of the labyrinth is the procedure of choice in unilateral Ménière's disease in an unserviceable nerve deaf ear.

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4. The more formidable neurosurgical differential section of the vestibular nerve is reserved for bilateral Ménière's disease.

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THE FENESTRATION OPERATION; ANALYSIS OF RESULTS

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Deafness in otosclerosis is produced by a new growth of bone which fixes the footplate of the stapes, closes the oval window and prevents the entrance of sound into the inner ear. Early in the course of the disease the inner ear retains normal or nearly normal function. For fifty years it has been known that if a new window is made into a normal or nearly normal inner ear, serviceable hearing can be restored. For forty years otologic surgeons have tried every conceivable method of maintaining the patency of these newly created windows. However, with osteogenesis there has always been bony closure with the disappointing recurrence of deafness.

HISTORY

Success was first achieved by Sourdille¹ of France. By means of a complex three or four stage operation for making a window in the horizontal semicircular canal he was able to maintain serviceable hearing in 40 per cent of his patients. In this country the ingenious Julius Lempert² devised a successful one stage operation by constructing a new window in the horizontal semicircular canal. By this procedure he reported maintained hearing improvement in the greater percentage of patients. In 1940, Lempert³ moved the position of this new window forward to the larger amputated end of the horizontal canal, the "surgical dome" of the vestibule, a larger, deep-

er window less likely to close by osteogenesis. During the past seven years refinements in technic have been added by Lempert,^{4, 5} Shambaugh⁶⁻⁹ and others so that today a correctly performed fenestration operation will usually result in maintained hearing improvement.

In the beginning the fenestration operation was heralded, not with enthusiasm, but with scorn and ridicule. In the past ten years, it has been subjected to severe analytical scrutiny by our most conservative otologists. It is now an accepted surgical procedure and has been hailed as one of the greatest advances in all modern surgery.

TECHNIC

There are many reasons for the success of the fenestration operation with the new oval window in the amputated end of the horizontal semicircular canal. These reasons are revealed in the technic.

In the fenestration operation the mastoid cortex is exposed through a triangular endaural incision. Mastoidectomy is performed. The roof and posterior wall of the bony external auditory canal are removed. The underlying skin is preserved as a delicate tympano-cutaneous flap continuous with the upper portion of the tympanic membrane. The incus and head of the malleus are removed to gain access to the amputated end of the horizontal semicircular canal, situated immediately superior to the oval window. All osteogenic bone dust is then removed under continuous irrigation as a large window is made in the amputated end of the horizontal semicircular canal. The margins of the window are surrounded by a wide flat area of the nonosteogenic enchondral bone of the labyrinth; these margins are polished with a gold burr to inhibit osteogenesis further. The osteogenetic endosteum is removed, care being taken not to injure its margins. The delicate membranous labyrinth is then free to adhere to the inner surface of the flap and prevent the ingrowth of bone. Before it is turned, the inner surface of the flap is debrided under magnification and all osteogenic bone spicules and bone dust are removed. The bone inhibiting

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squamous epithelium of the flap is then turned over the new oval window so that the epithelium covering the window is continuous with the vibrating tympanic membrane. The vibrating tympanic membrane transmits sound waves to the new oval window, giving additional hearing improvement.

INDICATIONS

Early in the course of its development the fenestration operation was regarded, at best, as surgery of the last resort to be attempted only when the patient had become profoundly deaf. We have learned that it is futile to operate upon patients who are almost completely deaf and who have little residual function of the inner ear. The most gratifying results are obtained in patients with moderate degrees of otosclerosis. The details of testing and the selection of patients have been described elsewhere.¹⁰ In general, the better the retained function of the inner ear, the more gratifying is the result.

RESULTS

To date I have performed 65 fenestration operations with increasing improvement in results. Fifty patients have passed through the immediate postoperative period, 44 of whom have regained serviceable or practicable serviceable hearing—success in 88 per cent of cases. Some of these patients will no doubt lose this regained hearing through bony closure of the new oval window. It is known that most of the windows will close within the first three months. Rarely will a window close after six months. In this series, of the patients who regained their hearing and have passed through the most critical six months' period, 95.4 per cent have maintained the hearing improvement. Five patients have maintained the hearing improvement for more than one year.

The result of the fenestration operation are evaluated solely upon the degree to which the formerly deaf patient has been rehabilitated. The result may be good, fair or poor. If a good result has been obtained, the patient is able to conduct the ordinary affairs of life and attend movies, church and group gatherings without significant

hearing handicap. The patient with a fair result is able to understand ordinary conversation at a distance of a few feet and to conduct his affairs without a hearing aid. Regardless of the hearing improvement, if a patient is unable to do these things, the result is classed as poor.

In these 50 cases, 40 patients have received good hearing (fig. 1). Their hearing

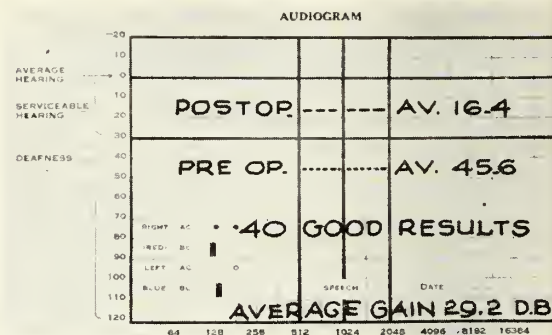


Fig. 1: Hearing improvement from the fenestration operation in 40 good results.

improved from an average preoperative level of 45.6 decibels to an average postoperative level of 16.4 decibels, an average gain of 29.2 decibels for the speech frequencies. Four patients have obtained fair results (fig. 2). Their hearing improved

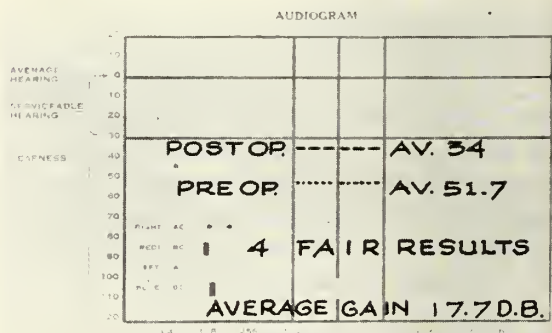


Fig. 2: Hearing improvement from the fenestration operation in four fair results.

from an average preoperative level of 51.5 decibels to an average postoperative level of 34 decibels, an average gain of 17.7 decibels for the speech frequencies.

Failures: In four patients the hearing was unchanged; in one it was made worse and there has been one closure. Four of the failures occurred in the first ten pa-

tients, three of whom were poorly selected since they did not have adequate retained inner ear function. I am unable to explain the fourth failure. Postoperative bleeding from the flap into the labyrinth was undoubtedly responsible in the patient whose hearing was made worse. The patient in whom the result was classified as a closure still has a positive reaction to the fistula test. This is not a bony closure; undoubtedly there has been an excessive formation of scar tissues in a hematoma at the new oval window. The patient still has a 17 decibel gain in hearing, but because his hearing has fallen to the 38 decibel level this case has been reported as a failure. There will be more closures in this series. Only time can determine the final results. However, other surgeons have found that with increasing experience there has been an improvement in their restoration and maintenance of serviceable hearing.

COMPLICATIONS

In this series there have been no severe complication and no deaths. There have been no cases of permanent facial paresis or permanent facial paralysis. Transient facial paralysis developed in one patient on the eighth postoperative day but completely disappeared by the twenty-first postoperative day. There have been no cases of persistent vertigo. One patient complains of mild vertigo on sudden change of position; this may be labyrinthine or functional vertigo. There is one patient who has mild suppuration of the operative cavity which may yet be cured. These results, which are comparable with others reported throughout the country, indicate that the fenestration operation is relatively free from serious risk.

CONCLUSIONS

Physicians and surgeons are often confronted with the problem of advising their patients and friends in regard to the fenestration operation. Patients can be told that the operation is relatively free from serious risk, and that in selected cases a properly performed fenestration operation will restore serviceable hearing, which, in

a large percentage of cases will last over a period of years if not permanently.

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LOUISIANA STUDY OF CHILD HEALTH SERVICES*

LOUISIANA STATE PEDIATRIC SOCIETY IN COOPERATION WITH THE AMERICAN ACADEMY OF PEDIATRICS

FOREWORD

This report of child health services in Louisiana represents our state's part of a nationwide study which has been in progress during the past three years under direction of the American Academy of Pediatrics. It is expected that this information and the cooperative enterprise which has secured it will continue as a constructive effort toward improving the health of infants and children in Louisiana.

The nationwide study was conceived in 1944 by members of the American Pediatric Society who, noting increasing public awareness of health matters, expressed their belief that physicians should assume *primary* responsibility in planning for the

*This is the first of a series of three articles, prepared by an Editorial Committee from the Louisiana State Pediatric Society.

medical care of the nation's children. A committee, representing the American Academy of Pediatrics, the American Pediatric Society, and the Maternal and Child Health Advisory Committee of the United States Children's Bureau, presented a report which was unanimously accepted by the members of the Academy during its 1944 meeting. The Academy then committed itself to the following objective:¹

"To make available to all mothers and children in the United States all essential preventive, diagnostic, and curative medical services of high quality which, used in cooperation with other services for children, will make this country an ideal place for children to grow into responsible citizens."

Faced with the inadequacy of data necessary for planning, the Academy launched a nationwide study of existing health services and facilities. Realizing the need of statistical services not ordinarily available to such a medical organization, the cooperation of the U. S. Public Health Service and the Children's Bureau was requested. A large measure of credit must go to these agencies for their willingness to assist and cooperate in the study, while leaving its development and direction entirely in the hands of the Academy's Committee. Generous financial assistance on the national level was afforded by the National Foundation for Infantile Paralysis, the National Institute of Health, the Field Foundation, and a number of commercial firms.

A "pilot study" was conducted in North Carolina, where technics were developed and tested. The North Carolina report² was published in April, 1948, and other states are now reporting.

Fact-finding is not enough. The Academy of Pediatrics has therefore appointed a national Committee on Improvement of Child Health for the purpose of reviewing the study and making recommendations on a national level. To implement the findings within each state, it is hoped that local ad-

visory committees will follow through in the same manner.

The purposes of the study were presented to the Louisiana State Pediatric Society in April, 1946. This body voted unanimous approval and accepted full responsibility for conduct of the study in Louisiana. Subsequent approval was given by the House of Delegates of the Louisiana State Medical Society and the Louisiana State Dental Association. The study in Louisiana was immediately instituted. It was completed and the office was closed in July, 1947. Thanks are due to the physicians and dentists of the state for their high degree of cooperation with the study and to the individual pediatricians who gave so generously of their time in its conduct.

Appreciation should also be expressed to the Louisiana State Department of Health and the Caddo-Shreveport Health Unit for their loan of two executive secretaries and for making available space, equipment, and other necessities for the study office. The Director of Local Health Services supervised the Study of Community Health Services.

The contribution of funds by the New Orleans and Shreveport Chapters of the National Foundation for Infantile Paralysis, the assistance of its State Representative and its local chapters are gratefully acknowledged. The Woman's Auxiliary to the Louisiana State Medical Society, through its local chapters, gave much assistance in follow-up procedures.

The Louisiana Commission on Hospital Care, authorized by the State Department of Institutions, rendered valuable services in the collection of data related to hospital services. The Department of Pediatrics of Tulane University generously permitted one of its fellows to serve as field representative in completing the study of pediatric services in hospitals of the state.

An advisory committee has been established, with representatives of the above and other interested organizations, including the Louisiana Hospital Association, the Parent-Teacher's Association, New Orleans Medical and Surgical Journal, the Academy

¹J. Ped. 25:625, Dec., 1944.

²Child Health Services in North Carolina. Supplement to North Carolina Med. J., Apr., '48.

of General Practice, the State Departments of Education and Public Welfare and the Louisiana Conference of Social Welfare. This committee will be especially valuable in translating the data of the study into action and in stimulating local interest.³

This report is being made available initially to the physicians and dentists of the state, then to any or all other interested organizations and individuals. In reporting these facts relating to child health in Louisiana we hope to stimulate an awareness of the health needs of children and to arouse interest in a concerted program for continued improvement.

CHAPTER I

INTRODUCTION

This study was set up to secure all possible information concerning facilities and services available for the health and medical care of children⁴ in Louisiana. The sources of information were (a) physicians and dentists; (b) voluntary and public community health services; (c) hospitals admitting children or maternity cases. A separate study of pediatric education was conducted on the national level and will not be dealt with in this report.

The data were recorded on standard forms identical with those used in all other states, relating to particular categories of information. These forms were distributed by mail or by personal visits by the executive secretary, field staff, or individual pediatricians. As a consequence of the unanimous approval of the State Pediatric Society and in order to take advantage of the individual pediatrician's knowledge of local conditions, each member was requested not only to fill out his own schedule, but also to assist in securing information from hospitals, community services, and

other physicians in his area. Moreover, each hospital of five or more beds was visited by a physician who checked final details.

In evidence of the splendid spirit of co-operation exhibited by all professional groups, this report is based on complete returns from 89 per cent of the pediatricians, 77 per cent of all physicians, 70 per cent of practicing dentists, 100 per cent of hospitals and 95 per cent of public health units in the state.

A record of each physician's and dentist's visits was obtained for a single day. One-seventh of these doctors reported for each of the days in the week, thus giving a complete composite picture. The records for pediatricians covered twenty-eight consecutive days. Corrections were made for seasonal variations and adjustments for those not reporting were calculated on the basis of a special study previously conducted by the National Office. Schedules for community health services and hospitals covered one year. Information concerning physicians and dentists in practice relates to the year 1946; hospital figures cover 1945-46; population estimates and community health services are reported on the basis of the year 1945. Since the most recent official census figures are for the year 1940, child population in each parish, as of July 1, 1945, was based on a special estimate⁵ taking all factors into consideration.

COMPARISONS WITH OTHER STATES

Although the national report and most of the state reports have not yet been published, many figures are now available for comparisons between states. In making such comparisons, it must be recognized that people often cross state or county lines to secure medical care. Certain valid conclusions may be reached, however, especially when regions are compared. For the latter purpose, the national office has di-

³We gratefully acknowledge the advice and assistance of the director and staff of the national office of the Study.

⁴In this report "children" refers to persons under 15 years of age, including newborn, unless otherwise specified.

⁵Data furnished by national office, Study of Child Health Services. Based on figures from the U. S. Bureau of the Census and the Louisiana State Department of Education.

vided the country into five large regions: Northeast and Central, Southeast, Southwest, Mountain and Plains, and Pacific (Fig. 1). Some of these groupings were ef-

14 adjacent; 30 isolated semirural and 16 isolated rural.

THE ECONOMIC AND CHILD HEALTH SETTING IN LOUISIANA

It is not possible in this report to consider all of the geographic, racial, cultural, and other socio-economic factors which influence the health of Louisiana's children. Mention of only a few will highlight this relationship and suggest problems which are allied to health. Louisiana is one of the southern states which has suffered economically because of primary dependence on agriculture and unrefined natural resources. During the past quarter century exploitation of oil, gas, minerals, and timber has improved this situation, so that economic factors now appear favorable for the future of the entire state.

The literacy rate, however, is among the lowest of the entire nation and adds to the medical economic problems of the hill land farmer of north Louisiana, the negro of the fertile valleys and cities, and the French trapper-fisherman of the coastal parishes. The latter also suffers because of transportation handicaps, even when near medical centers.

The national study confirms the generally accepted fact that the economic status of a region or state is an important determining factor in the amount and distribution of medical care. The income per capita in Louisiana for the period 1944-46 was \$811.⁸ Although higher than that of the majority or average for southern states (Fig. 1), this figure is low in comparison with the national average of \$1141 per capita and is exceeded in 37 of the 48 states. Moreover, it is regularly demonstrated that income per capita in rural counties is likely to be only one-half to two-thirds that of metropolitan counties.

Conversely, low income states and counties tend to have a higher proportion of children in the population. Louisiana's child population is estimated to be approximately 34 per cent of the total state popu-

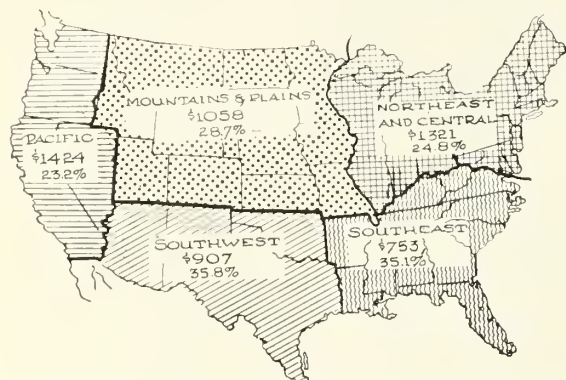


Figure 1. Regions, average annual income per capita (1944-1946) and per cent of total population which is children in each (1945).

fected in an attempt to keep major medical service areas intact.

COMPARISONS WITHIN LOUISIANA

An important aspect of the study is the determination of medical facilities and services available to local communities and families, not merely in the state as a unit. For this purpose, one must take into account population density (cities, towns, rural areas), proximity to cities where services might be available, and travel modes whereby these cities may be reached. Parishes⁶ have therefore been grouped, in accordance with similar nationwide classification, into metropolitan (having cities of 50,000 and over); adjacent (geographically contiguous to metropolitan); isolated (not touching a metropolitan county), which is subdivided into semirural (having an incorporated town of 2,500 or more) and rural (those without such towns). (Fig. 2).

According to this classification, Louisiana has 4 metropolitan⁷ parishes, Orleans, Jefferson, Caddo and East Baton Rouge;

⁶In Louisiana "parishes" are geographic and political areas which correspond to "counties" in other states.

⁷Hereafter, in this report, mention of metropolitan areas in Louisiana refers to those areas surrounding the three large cities, New Orleans, Shreveport and Baton Rouge.

⁸Sales Management: Vols. 54, 56 and 58, issue no. 10 of each volume. Copyright, Sales Management, Inc.

est percentage of draft rejections among all states.¹⁰

In 1945, 57,838 births¹¹ occurred in Louisiana, of which 39 per cent were negro, the third highest percentage of non-white births in the United States. The national figure was 12.4 per cent non-white births. During the same year, 80.8 per cent of live white births and 42.4 per cent of live negro births in Louisiana were attended in hospitals. However, 47.6 per cent of the negro births and 4.5 per cent of the white births

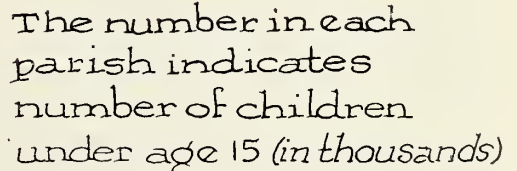


Figure 2. Population of children in the parishes of Louisiana.

had no medical attendant. It is gratifying to note that the percentage of both white

¹⁰Hirschfeld, G. and Strow, C. W.: Comparative Health Factors among the States, American Sociological Review, 11, No. 1, Feb. 1946.

¹¹National Office of Vital Statistics, United States Public Health Service.

and negro births which are attended by physicians and occur in hospitals has been increasing from year to year; figures for 1946 show further improvement.

Infant mortality is an important index of child health. During the period from 1941 through 1945, Louisiana's average infant mortality¹¹ (47.8 deaths under one year per 1000 live births) was the fourteenth highest of all the states. It should be noted, however, that marked improvement in infant mortality has been effected in Louisiana, from 70.1 in 1933, to 37.2 per thousand in 1946 (Fig. 3). It is also noteworthy that reported infant mortality in the isolated rural parishes¹² during the period 1941-45 was as low as it was in the metropolitan parishes of this state and almost identical with the national rate for rural counties. Moreover, the infant mortality for whites in Louisiana during 1945 was 33.2—twentieth among the states and lower than the national rate of 35.6. In the same year, the mortality for non-white infants in Louisiana was 58.3, ranking the state seventeenth for non-white mortality, and comparing with the national average of 57.0.

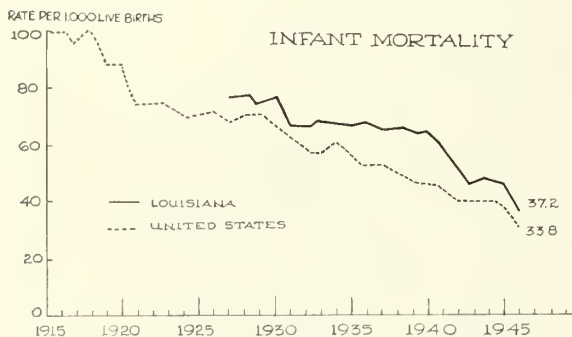


Figure 3 Trends of infant mortality in Louisiana (1927-1946), compared with national trends.

SUMMARY

1. Consideration of health facilities and needs of Louisiana's children must take into account numerous geographic, economic, racial and cultural factors which have had adverse effects in the past.

2. Louisiana's income of \$811 per capita during 1944-46 compares favorably with that of southern states but unfavorably with other sections of the country.

3. Sixty per cent of Louisiana's children live in isolated rural and semirural parishes.

4. General health factors in the state present an unfavorable picture; however, infant mortality rates for both white and colored show marked and steady improvement. The rates now compare well with the nation as a whole and the percentage of babies born in hospitals has increased markedly.

CHAPTER II

TOTAL VOLUME OF CHILD HEALTH SERVICES

The total volume of medical care to children was considered for our purposes to include (1) visits made by children to physicians' offices, and physicians' visits to children at home, (2) visits to clinics or conferences, and (3) days spent in hospitals. Figures obtained from the physicians themselves, as well as from hospitals and community health services, were employed to calculate the actual number of children receiving medical care on an average day. Each item received equal weight. It was found that, on an average day during the study period, 6762 children were seen by private physicians in home or office, 231 were seen in clinics and 1516 children were in hospitals.

Figure 4 demonstrates the total amount of care given per 1000 children in Louisiana as compared with the highest average and lowest rates found in the United States. In spite of the fact that there is no objective method of determining exactly what constitutes adequate medical care for children in any state, it can be safely assumed that in none, regardless of geographic or social differences, are they receiving too much. One would be overconfident to conclude that the children in our state require less medical care than those in other states, but it is apparent from this chart that they are receiving less, that is, our rate is less than half of that in the most favored state

¹²U. S. Children's Bureau, Division of Statistical Research, Feb. 16, 1948.

TABLE I

CHILDREN UNDER MEDICAL CARE IN LOUISIANA
ON AN AVERAGE DAY

	Louisiana	Metropolitan and Adjacent Parishes	Isolated Parishes
Children visited by physicians	6762	3238	3524
By general practitioners	4817	1678	3139
By pediatricians	998	823	175
By other specialists	947	737	210
Children visiting clinics	231*	167	33
Out patient departments	117*	82	21
Well-child clinics	97*	85	12
Mental hygiene clinics	3*	-----	-----
Clinics for the physically handicapped	14*	-----	-----
Children in hospitals	1516*	887	563
In general hospitals	1450	887	563
In special hospitals	66*	-----	-----

Total children under
medical care 8509 4292 4120

*Includes items not classified by parish group
and institutions with statewide service.

and about one-fifth less than the average for the nation. Louisiana children, furthermore, are receiving less care in each of the three categories: private practice, clinics, and hospitals, so that the deficiency is not confined to any particular type of medical care.

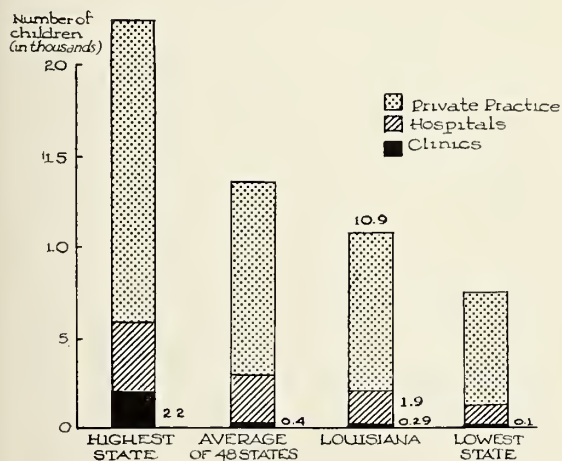


Figure 4. Total volume of medical care for children on an average day, per 1000 children in Louisiana; comparison with other states.

From the following table, it is evident that the children in isolated communities receive only two-thirds as much total med-

ical care as those in metropolitan areas; throughout the United States the former receive from three-fourths to nine-tenths as much as do the latter.

TABLE II

NUMBER OF CHILDREN IN LOUISIANA UNDER
MEDICAL CARE PER DAY PER 1000 CHILDREN

Type of Parish	Total children under medical care	Visited by physicians*	Visiting clinics**	In hospitals
Metropolitan and Adjacent	13.7	10.4	0.53	2.8
Isolated	8.8	7.5	0.07	1.2

*Office and home.

**Out-patient departments, well-child conferences, mental hygiene clinics and clinics for the physically handicapped.

The southeastern group of states as a whole has a rate of 10.9 children per 1000, under medical care in metropolitan counties as compared with 8.4 in isolated counties. Therefore, although Louisiana had about one-third more children under care in the metropolitan parishes than is generally found in this section of the country, our rate shows little variation from the regional average for children in isolated counties. This results in a greater disproportion in the amount of such services for children in rural and urban areas of our state than was found for most other states.

SUMMARY

(1) Children in Louisiana receive about one-half as much medical care as those in the state with the highest rate.

(2) Children in isolated parishes receive about two-thirds as much care as children in metropolitan and adjacent parishes of Louisiana, and less care than that received by children living in isolated areas of most other states.

DENTAL CARE

Dental care for children in Louisiana is provided almost entirely by dentists in private practice: on an average day 1325 children visited dentists' offices and 21

visited dental clinics. Children here receive approximately one-half as much dental care as those in the average state, and only one-fourth as much as those in the state with the highest rate. Dental clinics, serving 0.02 children per 1000 children, yield a rate that is one-fifth of the national average. From the following table it will be seen that in isolated parishes, where dental services are generally limited, clinics are practically non-existent.

TABLE III

NUMBER OF CHILDREN IN LOUISIANA UNDER DENTAL CARE PER DAY PER 1000 CHILDREN

Type of Parish	Private Dentists	Dental Clinics
Metropolitan and adjacent	2.29	0.05
Isolated	1.31	0.006

SUMMARY

(1) More than 98 per cent of dental care for children in Louisiana is rendered by dentists in private practice.

(2) Children in Louisiana receive about one-half as much dental care as those in the rest of the nation.

(3) Facilities for dental care to children in isolated parishes are inadequate.

CHAPTER III

HEALTH SUPERVISION

Continuing supervision, with periodic physical examinations, is considered essential in assuring health for children. Although preventive measures in the field of communicable diseases have been successfully carried out by official agencies for many years, today there is an ever-increasing demand on the physician in private practice to supply similar and allied services, particularly for infants and children. Parents are manifesting far greater interest in the maintenance of the child's good health as a *primary* consideration. Time spent in health supervision now constitutes a relatively large proportion of the private physician's daily work with children. In

Louisiana, 46 per cent of visits to pediatricians and 15.6 per cent of visits to general practitioners were made for health supervision.

In Fig. 5 is depicted the number of chil-

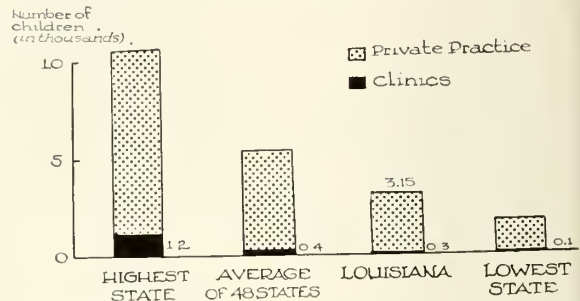


Figure 5. Children receiving health supervision on an average day, per 1000 children in Louisiana; comparison with other states.

dren who received health supervision on an average day in Louisiana: 3.15 per 1000 children under 5 years of age.¹⁴ This rate was less than one-third that for the highest ranking state, and about two-thirds that of the average for the United States generally.¹⁵ The rate for Louisiana was slightly higher, however, than that for the entire southeastern region which was 2.9 children per 1000 children under age 5.

It is apparent from Fig. 5 that 90 per cent or more of the health supervision of preschool children in this state was furnished by physicians in private practice and about 10 per cent by public agencies. Many of the conferences arranged by public agencies, moreover, were actually conducted by private practitioners (see Chapters IV and V). Further breakdown reveals that among private physicians, 58 per cent of this care was extended by general prac-

¹⁴This may be slightly overstated because figures for Well Child Conferences are based on attendance to age 6.

¹⁵Health Services for Children in the United States. American Academy of Pediatrics, Committee for the Study of Child Health Services. To be published by the Commonwealth Fund.

titioners, 41 per cent by pediatricians, and 1 per cent by other specialists.

As with total medical care, the amount of health supervision varied with parish type; again a lower rate of care was found in isolated parishes. In this instance, however, parishes adjacent to metropolitan areas showed the lowest rate for any, demonstrating that mere proximity to thickly populated regions does not guarantee adequate medical care. Comparison with rates for the nation and among parish or county types follows in Table IV. Figures for metropolitan areas of Louisiana compare much more favorably with the national average than do the others. Further discussion of health supervision will be incorporated in the discussions included in Chapter V of this series.

TABLE IV

NUMBER OF CHILDREN UNDER 5 YEARS RECEIVING
HEALTH SUPERVISION ON AN AVERAGE DAY
PER 1000 CHILDREN: COMPARISON BETWEEN
LOUISIANA AND THE UNITED STATES,
BY COUNTY OR PARISH TYPE

Type of County or Parish	Average Rate in Nation	Rates in Louisiana
Metropolitan counties	6.3	5.98
Adjacent counties	4.1	0.78
Isolated semirural	3.7	2.62
Isolated counties	2.1	1.04

SUMMARY

1. On an average day in Louisiana, 3.15 of every 1000 preschool children received health supervision; this rate was one-third less than that for the United States generally.

2. Physicians in private practice rendered more than 90 per cent of this service.

3. The amount of health supervision given in metropolitan parishes is far greater than that given in other parishes.

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Established 1844

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FORTY-SECOND ANNUAL MEETING OF THE SOUTHERN MEDICAL ASSOCIATION

Miami, Florida, October 25-28, 1948

The meeting in Miami has always been one which has many attractions to the members of the Southern Medical Association outside of the features of the program. This year the Louisiana State Society is honored in having Dr. Lucien A. Ledoux of New Orleans as President of the Southern Medical Association.

The program is a most attractive one. The pattern will be similar to that which

has been followed in previous years. Monday morning will be set aside for registration of the members and guests of the Southern Medical Association. The afternoon will be "Miami Day", with a program of a clinical nature, arranged by the profession of Miami. Beginning Tuesday morning, there will be the successive meetings of the twenty-one sections of the Southern Medical Association. Each section will have one half-day session.

In addition to the scientific program, many other interesting features have been arranged, such as sports for which Miami is so well known, and golf. A postconvention trip has been arranged to Cuba and Nassau.

The prospect for the whole meeting is a most satisfactory one. The meeting of the Southern Medical Association is the one meeting of the year at which the doctors of the South have the opportunity to learn to know each other and to renew acquaintances. At our various other medical meetings, specialization usually prevents anything more than a very limited contact with one's fellow-practitioners. The prospects for the coming session are indeed inviting.

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THE TEN-YEAR HEALTH PROGRAM OF THE FEDERAL SECURITY ADMINISTRATOR

On September 2, 1948, the Federal Security Administrator, Oscar R. Ewing, submitted a report to the President of the United States. This is a personal report, which when it was submitted was accompanied by a statement that the Administrator had secured the advice of more than 800 professional and community leaders—referring to the National Health Assembly.

On the one hand, this report is praised as a comprehensive plan for the betterment of the nation's health. This praise comes chiefly from those who have been active in supporting the various schemes that will lead to State Medicine, if followed. On the other hand, the report is looked upon as a campaign document, produced and

publicized at a time when it would have the most value for campaign purposes. From the medical point of view, the plan as a whole is another exhibition of Eutopian planning and thinking. Although Mr. Ewing is quoted as saying that the new plan is not "anything remotely approaching a program of socialized medicine," from the point of view of the practicing physician such a plan, if put into operation, would ultimately lead—in less than a ten-year period—to nothing more than *socialized medicine*.

The report asserts that "close to 70,000,000 people will have difficulty in providing adequate minimal care for themselves and their families." In other words, one-half the population is invited to carry in whole or in part the medical needs of the other half of the population. To this end a four-phase time table is presented.

Phase 1 is that of passage of Federal legislation and the setting of broad policies.

Phase 2 is a three-year tooling-up period to establish procedures towards services.

Phase 3, initial operation geared to existing facilities.

Phase 4, ultimate expansion to include complete medical coverage for everyone.

The expense that this will involve is approximate. Variouslly stated, it was thought that it would be \$4,000,000,000 a year for the medical phase of the program, and an additional \$10,000,000,000 for insurance. Such a scheme and such an expenditure would lead to the development of the most expensive and rigid bureaucracy in the history of our government.

This phenomenal taxation and regimentation is being proposed without assurance that it will accomplish any of the objectives for which it is being advocated. The position that organized medicine takes in this and other schemes of State Medicine is not that medical service is perfect as it is today, but that it has been brought to its present state of efficiency through the efforts of doctors themselves, and that the only plan that may be relied upon for progressive improvement in the field of medical service is through self-determination.

When the Ewing report is looked upon in the light of what it will do to medical services of this country, and in the light of its being an essential part of the Truman program, there is little doubt on which side of the election the interests of organized medicine will lie.

PROLAPSE OF THE GASTRIC MUCOSA

Symptoms with reference to the stomach are many, but organic disease within the stomach which will produce these symptoms is comparatively infrequent. In recent years, an additional organic disorder of the stomach has been recognized and can be looked upon as an explanation for a certain part of the dyspeptic's symptomatology.

Prolapse of the gastric mucosa through the pyloric ring is productive of signs and symptoms. The frequency of this condition has been indicated as being approximately equal to that of gastric ulcer.

The symptoms are not distinctive but are usually referable to disturbances in the upper gastrointestinal tract. They may be likened briefly to those of an atypical ulcer history. Intermittent attacks of epigastric distress occur, cramplike pain, a certain feeling of fullness after eating, and occasionally nausea and vomiting. There is a tendency for this condition to be relieved by small amounts of bland foods, or liquids, but seldom by alkalies. During an attack, solid food appears to precipitate an intensification of the symptoms.

The physical findings are not significant in themselves. Pain on deep palpation in the region of the pylorus is put down as a finding which is frequently noted at physical examination.

The diagnosis may be suspected when the history of dyspeptic disorder is atypical and yet persistent. It may also be suspected when the supposed ulcer is refractory to the usual ulcer regime. The diagnosis is primarily roentgenographic. The typical defect that the roentgenologist may look

for is a negative cauliflower-like defect in the base of the duodenal bulb opposite the pylorus, and this varies in size and shape during a single examination and upon repeated examination. It is also described as an umbrella or mushroom deformity, filling the base of the duodenal cap, but not deforming the outline of the cap. Hence, the duodenal cap is not as irritable as when a deformity of like size is due to an ulcer. In some cases, the rugae of the gastric mucosa can be traced through the pylorus into the deformity described. In certain instances, the fluoroscopic examination is suggestive of the diagnosis. However, it is stated that conclusive evidence is largely dependent upon identification of these same abnormalities in the films.

The condition has to be differentiated from all the usual organic disturbances in the antrum and duodenum. Among these are: Ulcers, either in the prolapsed mucosa or in the duodenum; hypertrophy of the gastric mucosa; polyps; duodenitis; and carcinoma.

The cause of the prolapse is regarded as an abnormal disturbance of gastric peri-

stalsis and function. It is variously suggested that in response to disordered neuromuscular activities of the stomach, the loose connective tissue between the mucosa and the muscularis is stretched. That in response to further disordered action, this mucosa in some way is caught in the peristaltic wave and carried into the pylorus. Once there, it is reasonable to expect that reflex disturbances will have the action of intensifying muscle spasm, which in turn is followed by edema and general gastric irritability.

The treatment of this condition is both medical and surgical. In the majority of cases, the patient's symptomatology subsides with gastric sedation and a bland diet. In certain instances, surgery is advised when the pain is intractable or when hemorrhage and gastric retention are significant factors.

Prolapse of the gastric mucosa thus becomes an additional organic cause for dyspepsia. The possibilities of its existence may well come under consideration when the patient's symptoms cannot be otherwise explained.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

LOUISIANA PREPAYMENT PLAN FOR SURGICAL SERVICE

HAVE YOU INFORMED YOUR SECRETARY ABOUT BLUE SHIELD?

The Louisiana State Medical Society organized the Louisiana Physicians Service two years ago. The funds needed for the organization of this nonprofit corporation were contributed by the State Society. The plan was subsequently approved by the Council on Medical Service of the AMA and was granted its seal of acceptance and was also accepted into full membership of Associated Medical Care Plans, which makes it

a participant in the National Blue Shield Plan.

The public, realizing that the doctor organized the Blue Shield Plan to help meet the hazards of catastrophic cost of surgery, readily accepted the plan. Since our organization we have enrolled more than 26,000 people in Louisiana in our Blue Shield Plan. That alone is proof that the public has accepted our plan.

It is true that in the beginning the plan was not perfect and it was necessary for us to make certain revisions. However, necessary things have been done and the

plan is now your plan and deserves your wholehearted support.

There is a doubt, however, as to whether or not our own members and their secretaries have accepted their own plan. We are being confronted every now and then with complaints from the members of our Blue Shield Plan, who, upon contacting their doctor, are surprised to find the doctor and/or secretary not familiar with the Blue Shield Plan. This is indeed discouraging, to say the least. Many doctors have signed agreements to participate in the plan; likewise, many doctors have then neglected to explain the details of the Blue Shield Plan to their secretaries and receptionists.

Your secretary is an important cog in the machinery. See that she has the necessary fee schedule and service blanks. If your secretary understands what the doctors are trying to do with Blue Shield, and the details of Blue Shield, we could go a long way in developing the plan, which, as you know, is the profession's answer to the bureaucrats. If your secretary knows that a single patient who is earning less than \$2000.00 a year, or a family whose income is less than \$3000.00 a year, is eligible, and that you have signed an agreement to furnish the services covered by the Plan for the fees set forth in the fee schedule, she is then in a position to properly handle and assist your patients with their financial responsibility for your services.

When our representatives contact the public and state that the Blue Shield certificate will do certain things, the doctors who are participating in the plan must see to it that the services agreed to by the participating physicians are performed.

Have you instructed your secretary to ask each patient, at the time she is securing the vital information so necessary to you (such as name, address, etc.), to ask the patient if he is a member of the Blue Shield Plan? Find out at the time you are making your financial arrangements. If, when making these arrangements, there is a doubt in your mind as to whether or not the patient is in the low income group, and thereby entitled to full coverage, suggest to the patient that he convince you he is in the low income group. You realize, we are sure, that if the patient's income exceeds the \$2000.00 and \$3000.00 brackets as mentioned above, you make your regular charge for such services and apply the payment from the Plan as a credit against your charge. These and many other suggestions could be given to your secretary which would assist you and the Plan tremendously.

We cannot urge you too strongly to educate your secretary as to what we are trying to do with the Blue Shield Plan.

Should you or your secretary desire any information, just drop us a line c/o Louisiana Physicians Service, Inc., Room 103, 1430 Tulane Avenue, New Orleans, La.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

CHANGE ON FRONT COVER OF THE JOURNAL

The space previously occupied by the Fenwick Sanitarium on the front page of the Journal has been bought by Eli Lilly and Company at a price double that charged to the Fenwick Sanitarium. For this reason, the Fenwick Sanitarium has purchased space facing Eli Lilly insert page of the Journal, opposite the first page of reading matter. The Journal Committee and the Fenwick Sanitarium regret the necessity for this change since the Fenwick Sanitarium has occupied this space in our Journal for so many years.



The Blue Shield shown above is the adopted symbol of non-profit medical and surgical care plans approved by the Associated Medical Care Plans. The emblem will be identified in the public mind with prepaid medical and surgical care just as the Blue Cross symbolizes prepaid hospital care.

The Blue Shield Plan is founded upon three principles:

1. Voluntary participation and the preservation of freedom for the patient and his doctor.
2. Free choice of doctor, by free patients, from among free doctors.
3. A minimal and fair payment for good medical care when the patient's income or resources are limited.

The Blue Shield Plan was designed to serve you and your patients. It can operate successfully only

if each physician gives all necessary information when submitting claims. Insufficient data causes delay in making payments and increases administrative costs.

By becoming a Participating Physician in the Blue Shield Plan, you signify your belief in the "voluntary way"; you declare your opposition to compulsory "State Medicine"; and you join with other social-minded physicians who are giving their active support to your own profession-sponsored medical care Plan. Have you done your part?

Your office assistant will find this column helpful in filling out claim forms. Will you suggest that she refer to it regularly for instructions?

SECOND DISTRICT MEDICAL SOCIETY

The regular meeting of the Second District Medical Society was held at the Wigwam Restaurant, Dr. Joel Gray president, presiding. Dr. Ambrose Storck presented a paper and films on the activities of the Louisiana Division of the American Cancer Society. Dr. David Fichman then gave a talk on the Community Chest. A short business session followed.

MEETING ON TROPICAL MEDICINE

There will be a meeting in New Orleans, December 5-8, of groups interested in tropical medicine in the United States. The four societies which will meet jointly, with headquarters at the Roosevelt Hotel, are the American Society of Tropical Medicine, the National Malaria Society, the American Academy of Tropical Medicine, and the American Society of Parasitologists. A number of papers will be presented on subjects in the various branches of tropical medicine and parasitology and all members of the Louisiana State Medical Society with exception of interns and residents are invited to attend on proper registration. Registration fee \$1.00.

BOOK REVIEWS

The Years After Fifty: By Wingate M. Johnson, M. D. New York, McGraw-Hill Bk. Co., 1947. Pp. 153. Price, \$2.00.

This delightful, interesting, and informative small book, though meant primarily for the layman, may be read with profit by the physician. The author capably blends a mixture of anatomy, physiology and pathology in order to make the rationale of hygiene and psychosomatic medicine readily understandable to the intelligent reader.

I. L. ROBBINS, M. D.

Office Immunology, Including Allergy: Edited by Marion B. Sulzberger, M. D. and Rudolf L. Baer, M. D. Chicago, Year Book Publishers, Inc., 1947. Pp. 420. Price, \$6.50.

This is a very useful book to the general practitioner for it brings together between two covers the most important immunologic procedures in a concise practical way. Thus the immunology and prophylaxis of all of the common, and most of the unusual infectious diseases are covered. A good synoptic review of common technics; diagnostic, prophylactic and therapeutic, is included. The sec-

tion on dermatologic immunology is both authoritative and useful, especially in the discussion of eczematous contact-type allergic dermatitis. The book can be unreservedly recommended to the clientele for which it is intended.

VINCENT J. DERBES, M. D.

Handbook of Psychiatry: By Winfred Overholser, A. B., M. D., Sc. D. and Winifred V. Richmond, B. S., A. M., Ph. D. Philadelphia, J. B. Lippincott Company, 1947. Pp. 252. Price, \$4.00.

Dr. Overholser and Dr. Richmond have eminently succeeded in producing an outstanding textbook of psychiatry which will please everyone in the field.

The first portion of the book gives a brief introduction to what is covered in the field of psychiatry, psychology and psychoanalysis and in the second chapter considerable effort is made to show the errors in the etiology of mental disease common in many lay minds. It is refreshing to see that an effort is made to show that heredity, fatigue, overwork and sexual excesses have been utilized far too long a time in an attempt to explain emotional disturbances.

Dr. Overholser discusses at length modern hospitalization; the admission procedures involved in the care of a psychiatric patient and then he proceeds to review briefly the various psychoses, psychopathic states, and psychoneuroses. The author is eminently fitted to discuss the relation between mental disease and crime since, for several years, he has written extensively on this subject. It is regretted that this particular section of the book is not more extensive.

All in all it is felt that this new text book on psychiatry can be wholeheartedly recommended.

JOHN W. BICK, JR., M. D.

Internal Medicine in General Practice: By Robert Pratt McCombs, B. S., M. D., F. A. C. P. 2d ed. Philadelphia, W. B. Saunders Co., 1947. Illus. Pp. 741. Price, \$8.00.

In this excellent volume, Dr. McCombs attempts to provide for the general practitioner information about the most commonly encountered of those diseases which are usually classified as within the domain of "internal medicine". Inasmuch as it is difficult (if not impossible) to define "internal medicine", there will probably be many readers who question his choice of material covered. Despite this, there is included a rather general survey of most of those conditions which either the general practitioner or the internist would encounter in every-day practice.

Necessarily discussion of each subject is brief, but adequate. There are many color illustrations which add to the value of the discussion; it is unfortunate that no such illustrations accompany the chapters describing the exanthemata. The chapters on disorders of the cardiovascular and of

the renal systems are unusually well presented; the presentations of the anemias and of the infectious diseases are thorough.

The average general practitioner can profit considerably by having this book available for quick reference. It will save him much time when he needs assistance for a troublesome diagnostic or therapeutic problem.

SYDNEY JACOBS, M. D.

Ulcer, the Primary Cause of Gastric and Duodenal Ulcer; Diagnosis, Medical and Surgical Treatment, Prevention: By Donald Cook, B. A., M. D. Chicago, Medical Center Foundation and Fund, 1946. Pp. 187.

This volume contains a series of lectures, all relating to peptic ulcer, which the author has delivered to 25 medical societies and 15 other groups, during the years 1936-46. Illustrations and reference lists are included.

STANLEY COHEN, M. D.

History of the Medical Society of the County of Westchester, 1797-1947: Published by the Medical Society of the County of Westchester, 1947. Facsimiles. Pp. 193.

The histories of medical societies, and the medical histories of limited areas fill a special need for the historian and research worker in medical history. Such works are often the sole source of the information needed. With this idea the present volume is a welcome addition to the list of such studies. It is a compilation from the available minutes of the Society for the past one hundred and fifty years, as well as from contemporary sources covering the years for which the minutes of the Society have been lost. In 1922, Dr. Henry T. Kelly published an Historical Sketch briefly covering the progress of the Society during its first 125 years. This sketch was privately printed and distributed; it is therefore reprinted in the present volume, with appendices which bring the record to 1947. The volume bespeaks the care of its preparation.

MARY LOUISE MARSHALL

Epilepsy; Psychiatric Aspects of Convulsive Disorders: By Paul H. Hoch, M. D. and Robert P. Knight, M. D. New York, Grune & Stratton, 1947. Pp. 214. Price, \$4.00.

Doctors Hoch and Knight have here edited a small text book made up of contributions from several authors.

The subject of epilepsy is discussed in every detail. It approaches the standpoint of etiology, sociology, pharmacology and psychopathology.

The section on the psychopathology of epilepsy is especially outstanding. It is hoped that this book will be widely read by all physicians dealing with the subject. Too many physicians have the

concept that the treatment of the epileptic merely revolves around the adjustment to his dosage of drugs. Dr. Bela Mittleman discusses at some length the role which various psychologic measures play in the epileptic and leaves us with a clear concept of how important management of his hostility and anxiety really are. Dr. Herbert Jasper contributes an excellent section on the electro-encephalograph in epilepsy.

In the opinion of the reviewer this is one of the best texts on the subject to make its appearance in recent years.

JOHN W. BICK, JR., M. D.

Psychiatric Examination of the School Child: By Muriel B. Hall, M. D. Baltimore, Williams and Wilkins Company, 1947. Pp. 368. Price, \$4.50.

The author, an English psychiatrist, defines the scope of her book as "confined to children of compulsory school age—from five to fifteen years—who are receiving full-time education. The special problems of the pre-school child, or of those young people who have left school to enter the industrial world, have not been included."

She has attempted "to describe and discuss what happens at a clinic to which a child is sent for psychiatric opinion." The opening chapters include a brief history of child psychiatry. The book is divided into three main sections, dealing respectively with: (1) Complaints and investigations. (2) Description and discussion of groups of disorders (physical, temperamental, personality and behavior, juvenile delinquency, psychoneuroses, psychoses and psychopathic states). (3) Recommendations and reports.

Doctor Hall states that the book is "designed for the medical practitioner," and "is not primarily intended . . . to provide a textbook of child psychiatry." From this standpoint, her work seems fairly comprehensive and sound.

One feature especially to be commended is the author's forthright stand on the question of explaining a child's mental deficiency to his parents. Too often has this reviewer encountered parents of mental defectives, encouraged by well meant assurance that their child "will grow out of it." Doctor Hall considers it "a serious blunder for lay or medical persons to raise the expectations of parents in regard to mentally defective children." She advises them to seek expert opinion, so that they will learn, and be helped to accept, the truth about their child as soon as possible.

The weakest feature of "Psychiatric Examination of the School Child" is the author's omission of the clinical psychologist's role in such examination; and the omission or too brief mention of the most frequently used tests in clinical diagnoses. She mentions the role of the "educational psychologist," but advises that "every child psychiatrist (be) equipped to undertake intelligence testing, either for regular use in routine specialist prac-

tice . . . or in full time child guidance work for occasional application to pathologic cases of special difficulty." She ignores the clinical psychologist and his contribution to the understanding of behavior maladjustments. The value of the Stanford Binet Test, administered either by an educational psychologist or by a psychiatrist, is stressed. But psychologic study by means of the Wechsler Bellevue Scale, the Thematic Apperception Test, and the Rorschach Test is not mentioned, except for one brief reference to the Rorschach as requiring "skill in interpretation, and . . . not, therefore, a test of general applicability." The close cooperation between the clinical psychologist who interprets results of various projective techniques, and the psychiatrist who formulates treatment plans for the child or adolescent is given no recognition. Even the importance of emotional factors in cases of reading disability is not sufficiently stressed, and the author's emphasis is on the rare cases with neurologic components. She has not accepted, or is unaware, of more recent views regarding reading disability.

In this reviewer's opinion, "Psychiatric Examination of the School Child" has the limited value of acquainting the psychiatrically uninformed with some problems and methods encountered when dealing with disorders of childhood and adolescence.

Lack of adequate discussion of the significance of play therapy in diagnosis and prognosis, the role of emotional conflict in reading disability, and the role of the clinical psychologist in a psychiatric clinic, constitute serious limitations to the value of the book.

MARION FONT, M. A.

PUBLICATIONS RECEIVED

Blakiston Company, Philadelphia: *Essentials of Pathology*, by Lawrence W. Smith, M. D., F. C. A. P. and Edwin S. Gault, M. D., F. C. A. P.

Commonwealth Fund, New York: *Hospital Trends and Developments (1940-1946)*, edited by A. C. Bachmeyer, M. D. and Gerhard Hartman, Ph. D.

Grune & Stratton, Inc., New York: *Occupational Marks*, by Francesco Ronchese, M. D.

C. V. Mosby Company, St. Louis: *Handbook of Orthopaedic Surgery*, by Alfred Rives Shands, Jr., B. A., M. D. *Microbiology and Pathology (Fourth Edition)*, by Charles F. Carter, B. S., M. D.

W. B. Saunders Company, Philadelphia: *A-B-C's of Sulfonamide and Antibiotic Therapy*, by Perrin M. Long, M. D., F. R. C. P.

Charles C. Thomas, Springfield, Illinois: *Neurosurgical Pathology*, by I. Mark Scheinker, M. D.

Washington Institute of Medicine Research Foundation (The Linacre Press), Washington, D. C.: *The Alcoholic Woman*, by Benjamin Karpman, M. D.

WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

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Mrs. Arthur D. Long, Baton Rouge, 1946-47.
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1948-49

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A MESSAGE TO THE WOMAN'S AUXILIARY

It was gratifying to the writer, as well as to the doctors in attendance at the recent convention in Monroe, to see the large group taking part in the activities of the Woman's Auxiliary to the Louisiana State Medical Society.

The interest shown by the doctors' wives and their grasp of the problems with which we are now faced is excellent for the profession. The greatest need for us all at this critical time is that we be well informed on all phases of economic life and their ever changing relationship to the doctor and his work. It is here that the members of the Woman's Auxiliaries all over the State of Louisiana, as well as throughout the nation, can do their most valuable piece of work.

The program of study and the projects already outlined by the Auxiliary for the coming year will, I believe, result in a group of exceptionally well informed women who will go out in the communities where they live and work and give the doctors the kind of public relations that will result in better understanding for all.

I feel sure that in the coming year the Advisory Committee will give its closest cooperation in making the work of the Woman's Auxiliary successful.

H. P. Forsyth, M. D.,

Chairman, Advisory Committee.

MESSAGE OF PAST PRESIDENT OF WOMAN'S AUXILIARY

Auxiliary members will remember that our leading project for 1947-48 was the promotion of Louisiana Physicians' Service. For this year the outstanding new work will be to assist the Council on Medical Service and Public Relations in its

school health program. In this message I should like to give a few brief facts concerning the present status of the first of the above projects and to tell a little of what we may do regarding the second.

On the prepayment medical care front, you will be interested to know that now every state in the Union except two—South Carolina and Georgia—has a prepayment program either in operation or well along in the organization stage. Forty-two states have plans in operation. Four states have a program approved but not yet in operation. Two states are still in the process of studying plans. Michigan has passed its millionth subscriber mark, now having 1,075,000 enrolled in its prepayment plan. Louisiana, with its plan only in its third year of operation, has 25,817 subscribers, and an aggregate income of \$220,000. Louisiana provides more coverage per contract than any other state but one.

So, progress is being made but there is still much to be done and the continued support of doctors' wives is urged.

The project of the Council on Medical Service and Public Relations of the Louisiana State Medical Society to improve health conditions among school children of the state is one which should receive earnest support from every citizen. Especially should parents, teachers, school officials and certainly the Woman's Auxiliary, do everything possible to aid in this program.

The first objective of a four-point plan is to have every first grade child in the state receive a thorough physical examination. Gradual expansion, it is hoped, will include every child to and through high school. The plan is already in effect in the City of New Orleans. It is badly needed in the rest of the state, especially in the rural areas. Some of you will remember conditions which I described to you which I had personally seen in my travels about Louisiana.

An encouraging fact is that Dr. Friedrichs' committee has the cooperation of the State Department of Health, the State Department of Education and the Health Council of the State Farm Bureau. All of these groups plan to work together. However, there are many instances of individual indifference and of actual opposition to health work in schools, and it is in such cases that Auxiliary members can do necessary missionary

work. In one parish last year, for instance, a principal refused to allow the parish health nurse to come to his school, but instead compelled her to go to the Court House to give immunization shots. This same principal refused to have a parent-teacher club in his school. This attitude must be overcome before any school health program can meet with success. Auxiliary members, it seems to me, especially those who are also members of the P. T. A., are adequately fitted to accomplish the desired change.

When the plans of the Council are completed, Auxiliary members will be told in just what manner they can best help. But meantime, please begin the missionary work.

May I thank you again for your splendid co-operation with my administration and urge a continuance of that same fine spirit during Mrs. Owens' term.

BARBARA PORTER WARREN
(MRS. JAMES W. WARREN)

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1. Assisting Council on Medical Service.
2. Education: Membership. Laity.
3. Legislation.
4. Rural medical service.
5. Medical cultural items.
6. Hygeia.
7. Organization.
8. Health days.
9. Red Cross.
10. Cancer.
11. Doctors' Day.

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ON THE ETIOLOGY OF NEPHRITIS*

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In order to discuss the etiology of nephritis we must define what kind of kidney disease we are talking about. This requires some statement of the classification of renal disease which is far from satisfactory or settled. The general grouping proposed by Volhard and Fahr,¹ and by Addis² in slightly different terms, is at present pretty generally accepted. This includes three great groups—inflammatory, vascular, and degenerative or nephrotic—the first two being primarily disease of the glomeruli, the third manifested chiefly by changes in

the renal tubules. Several thoughtful modifications or elaborations have been made in the light of further study, notably by Bell³ and very recently by Leiter.⁴ (Table I) Both of these remove the so-called lipoid nephrosis from the group of tubular diseases, since abnormal glomerular permeability to plasma proteins is probably the primary defect in the disease. Bell calls it membranous nephritis, and Leiter, glomerulonephrosis. Either grouping must be regarded as tentative until it is determined whether lipoid nephrosis is a disease entity or simply a peculiar stage in the course of chronic glomerulonephritis. Certainly adults with the nephrotic syndrome usually lose their edema, develop hypertension and

TABLE I
CLASSIFICATIONS OF RENAL DISEASE

BELL	LEITER
1. Glomerular Diseases	1. Glomerulonephritis
a) Proliferative glomerulonephritis	(Acute; chronic)
(Acute; chronic)	2. Glomerulonephrosis
b) Membranous glomerulonephritis	(Lipoid; amyloid)
(Lipoid nephrosis)	3. Glomerulosclerosis
c) Amyloid disease	(Arteriolar; diabetic)
d) Toxemias of pregnancy	4. Glomerulitis
2. Tubular Diseases	(Toxic; embolic; allergic)
a) Degenerative	5. Pyelonephritis
b) Obstructive	(Acute; chronic)
3. Diseases of Interstitial Tissue	6. Vascular
a) Cortical abscess	(Arteriosclerotic; allergic)
b) Pyelonephritis	7. Tubular
4. Diseases of Vascular System	(Necrotizing: obstructive; degenerative)

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renal insufficiency, and die as chronic nephritics. In children many more apparently recover completely—the others used to die of intercurrent infection, especially pneumococcic, but now with antibiotics

more go on to develop chronic nephritis. It is the pediatricians in particular who hold out for lipid nephrosis as a metabolic disease, but even in this group opinion is far from unanimous.

Ellis⁵ believes that there are two types of inflammatory Bright's disease. One type develops acutely after a recognized upper respiratory tract infection, and is most common in the first two decades. Fever, malaise, headache, and such general symptoms are common. Hematuria is constant, but edema is of short duration. The prognosis is good, recovery occurring in some 80 per cent. The other type is characterized by insidious onset, without recognized preceding infection, edema is persistent, and prognosis poor. There is, however, considerable overlapping, and neither the course nor pathologic picture permits determination in which group many cases should be placed. This division has not been widely accepted in this country. It seems that the two types may simply represent extreme variations which the same disease may show.

The foundation of any attempt to interpret the mechanism by which acute glomerulonephritis develops must be based on several well known characteristics of the disease. (1) Its onset is almost always preceded by infection with hemolytic streptococci. (2) Only a small proportion of patients with such infections develop frank nephritis. Some abnormalities of the urine, as measured by Addis counts, are present in a much higher proportion. (3) A latent period of 12-25 days intervenes between the onset of the infection and the onset of the nephritis. (4) This latent period is much shorter in exacerbations of a previously existing nephritis. (5) Bacteria can rarely be found in urine or kidneys of patients with glomerulonephritis.

These facts point strongly to the view that acute nephritis in man represents an allergic reaction occurring in the kidneys, presumably as the result of an auto-immune response to kidney protein rendered antigenic by the toxic or denaturant action of

some streptococcal product or combined streptococcal-tissue product.

Experimentally renal lesions have been produced by injection of nephrotoxic sera. In 1934 Masugi⁶ obtained lesions closely simulating human nephritis by injecting rabbits with antikidney serum prepared in the duck. However, Kay⁷ has pointed out that even the Masugi nephritis cannot be a simple kidney antigen-kidney antibody reaction, because there is a latent period before the appearance of a renal lesion. It is impossible to produce antikidney antibodies in the same species by the Masugi technic. A further step was made by the Caveltis⁸ who suggested that the kidney acts as a hapten and the streptococcus as the protein carrier in an auto-antibody response. They produced lesions in rats which closely simulated both acute and chronic nephritis by injection of mixtures of killed streptococci and kidney extracts.

The human situation may be much more complex than such experiments would indicate. Kay, Luchesi and Rutherford⁹ were unable to demonstrate antikidney antibodies in the serum of patients with acute nephritis by complement fixation or precipitins. There is much evidence that in acute nephritis there is disease of small vessels throughout the body, and not only in the kidney. The frequency of cardiac dilatation, unrelated to hypertension, electrocardiographic changes, and the perivascular lesions and acute arteriolitis reported by Stone¹⁰ and by Feller and Hurevitz¹¹ in biopsies of muscle support this belief. This does not exclude the whole hypothesis. A combined or complex auto-antigen may be responsible for the diffuse lesions similar to the polyarteritis and periarteritis-nodosa like lesions produced by Rich¹² in rabbits by a sulfa drug and horse serum.

One point in the experiments of the Caveltis' is of particular importance. They produced chronic nephritis in rats by a single injection of streptococci and kidney extract. Some animals died in the acute phase, some apparently recovered but some after subsidence of acute symptoms

developed a chronic nephritis with decrease in function. That is, a chronic nephritis followed a single insult, without repeated introduction of antigen. This to me fits in with human disease, where the chronic nephritis progresses without any discoverable infection being present.

That the kidneys are somehow involved in essential hypertension and hypertensive vascular disease is pretty generally accepted. All the evidence indicates that arteriolar disease is more common and more severe in the kidneys of hypertensives than in normotensives, and in the hypertensives it is more severe in the kidneys than in other organs (except spleen). The question, however, is whether this arteriolar nephrosclerosis is the primary factor in "essential" hypertension, or is simply part of the functional vascular derangement produced by persistent hypertension.

Goldblatt¹⁴ believes that the arteriosclerosis is primary, leads to a disturbance in renal hemodynamics, this in turn to an increased formation of renin, which after activation, leads to generalized vasoconstriction and hence to hypertension. Others, as Goldring and Chasis,¹⁵ Katz and Leiter,¹⁶ and Page and Corcoran¹⁷ believe that the initiating factor of the general vasoconstriction is unknown, perhaps psychogenic or neurogenic, and that the disturbance in renal hemodynamics is part of this functional vascular derangement. In favor of this view they point to the symmetrical changes in glomerular and tubular function as measured by clearance methods, the bilaterality of pathologic changes, and the early lability of the blood pressure. On the other hand, there are many similarities between the experimental and clinical disease. In both the increased tension is the result of a generalized increase of peripheral resistance. In both there may be no detectable change in renal function, or severe renal insufficiency, depending in the dog on the degree of constriction of renal arteries and in man on the amount of renal tissue remaining. In both, cardiac rate, output, pulmonary artery pressure, and venous pressure are normal. In both, hypertension

associated with unilateral disease may be cured by removal of the diseased kidney provided the other is normal.

Both theories have a serious gap. The Goldblatt hypothesis does not explain why the renal arterioles get sclerotic in the first place and the primary neurogenic hypothesis does not explain the much greater change in renal than in other vessels. The objection of Goldring and Chasis that the normal clearance and estimated renal blood flow exclude "renal ischemia" is not valid, for many of Goldblatt's dogs had normal renal function. Possibly the elevated blood pressure maintains a normal renal flow in spite of mechanical obstruction. Certainly the lability of the blood pressure in early stages suggests a nervous or nervous-hormonal mechanism. Much attention is again being given to the role of salt, or rather sodium, retention in the production of both experimental and human hypertension.¹⁸ What this means in regard to the relation of adrenal cortical hormones to hypertension cannot be clearly seen at present. Perera¹⁹ and his associates have shown recently that patients with essential hypertension respond to sodium restriction as though they had excessive desoxycorticosterone in them. This is certainly a fertile field for those who believe in the psychogenic or neuro-endocrine theory of the origin of essential hypertension.²⁰

That heavy metals and certain other poisons produce lesions in fairly specific parts of the tubules is well known. Recently much attention has been directed to a similar clinical picture occurring in a wide variety of conditions—hemorrhage, surgical shock, crushing injuries, various infections, etc. Some of these show the most striking degeneration in the distal tubule, rather than in the proximal as with heavy metals, and for these Lucke²¹ has used the term "lower nephron nephrosis" and Malgraith²² "tubovascular syndrome." The dividing line between these conditions and the organic chemical nephroses is in many ways a tenuous one. The important unifying feature is what McCance and Lawrence²³ have aptly called "functional disorder."

ganization" of the kidney. The renal tubule loses its highly selective ability to reabsorb certain elements and to discard others in the glomerular filtrate. Salt, nonprotein nitrogen, glucose, water, acids, bases, etc., may diffuse back completely through the disorganized tubule. The result is the passage of only small volumes of dilute urine, or anuria, and the rapid development of uremia superimposed on the patients' other troubles.

Aside from the heavy metal poisons, the mechanism producing these nephroses is apparently too long a period of renal anoxia, resulting from low blood pressure and diminished renal flow.²⁴ Trueta²⁵ on the basis of extensive experiments on rabbits believes that in shock, etc., blood is directed from its normal cortical course to those glomeruli lying nearer the medulla, with a resulting cortical ischemia. This has been called a renal shunt but it is not a shunt in the sense of opening up of channels not usually perfused but rather the continuance of blood flow in only one of two channels which are both normally open. That an abnormally large volume of blood goes through the open channel is unproved. While Trueta did not measure blood flow, all his data indicate that it was reduced whenever cortical ischemia was present.

Early recognition and prompt treatment are essential, for there are only two alternatives in this condition; complete recovery or death from uremia. Chronic intermediate stages do not seem to occur. While the human kidney can stand even complete interruption of its arterial supply for twenty or thirty minutes, when cortical ischemia persists for twelve or twenty-four hours, severe functional if not histologic changes are produced in tubule cells.

There are other types of renal disease, with probably distinctive etiologies, for which the mechanisms are more or less understood. These include the intercapillary glomerulosclerosis of diabetes mellitus, the renal defect in Addison's disease, diabetic insipidus, rickets, Cushing's syndrome, and pyelonephritis, but a discus-

sion of these is beyond the scope of this presentation.

SUMMARY

Recent studies have led to modifications of the classification of renal disease, permitting the recognition of noninflammatory or vascular glomerular lesions, the elimination of focal glomerulonephritis, and a better understanding of the diseases affecting the renal tubules primarily.

Glomerulonephritis is believed to be due to an allergic reaction manifested chiefly in the kidneys, and resulting from an abnormal response to infection, which is usually streptococcal. The importance of renal arteriolar sclerosis in essential hypertension is recognized, but whether this is primary, or the result of psychogenic or hormonal influences is unsettled. Aside from poisoning by heavy metals and organic compounds, the most important cause of tubular degeneration appears to be anoxia from diminished renal blood flow.

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THE PATHOLOGICAL PHYSIOLOGY OF CHRONIC NEPHRITIS*

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Before discussing the physiology of chronic nephritis, it is necessary to recall a few anatomical facts. Each human kidney is made up of approximately a million and a quarter units or nephrons, each consisting of a glomerulus and its attached tubule. This number is present at birth, and in health persists throughout life. There is no regeneration or new formation of glomeruli. Once a glomerulus is destroyed by disease, the total glomerular equipment of the subject is reduced. The condition is quite different, however, with the epithelium of the convoluted tubules. Here regeneration takes place readily and rapidly, presumably from those cells which have escaped destruction.

In certain types of chronic nephritis (chronic glomerular nephritis and vascular disease or arteriolar nephrosclerosis) the kidneys are reduced in size, and examination of microscopic sections shows many destroyed glomeruli and hyaline scars. Neither the size of the kidney nor the number of visible scars bears any satisfactory

relation to the duration of disease or the degree of impairment of kidney function. While many of the remaining glomeruli are seen to be more or less damaged, the tubular epithelium is frequently not strikingly abnormal. If the remaining nephrons functioned in the normal manner, such kidneys might be expected to excrete a small amount of normally concentrated urine. In fact, however, the urine volume is increased, and concentrating power is diminished or lost. Must it be assumed, therefore, that in addition to the apparent loss of a number of nephrons, those which remain are qualitatively abnormal?

One of the first questions to be answered in the study of the subject was whether the reduction in the size of the kidney in chronic Bright's disease was a measure of the reduction in the number of nephrons. This involved counting the number of glomeruli. Fortunately, Kunkel¹ had developed a method which with slight modification was suitable.

In 14 normal kidneys from patients aged one hour to 88 years, the total number of glomerular structures varied from 940,000 to 1,542,000. The mean was $1,282.8 \pm 37.7$ thousand.² Some few hyaline scars of destroyed glomeruli were identified in 10 of the 14 kidneys, particularly in the older subjects. In chronic glomerular nephritis and in vascular disease, however, the number of possibly patent glomeruli is usually reduced to below 500,000 and may be below 200,000 while the total number of recognizable glomerular structures, including scars, is likewise reduced. The reduction of the number of glomeruli was not paralleled by a corresponding reduction from the expected normal weight of the kidney. Nor could the reduction in the number of glomeruli be judged by the relative number of hyaline scars, for in some kidneys with a low total number of recognizable glomerular structures, the percentage of scars was relatively low.

The reduction in the total number of recognizable glomerular structures indicates that in chronic kidney disease many of these may disappear without leaving

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recognizable trace. The same result was obtained in rabbits whose kidneys had been injured by x-rays or by kinking of the ureter for a few days.

If a large proportion of the glomeruli in chronic renal disease can disappear without leaving a trace, the final histologic examination may give less information concerning the pathogenesis and severity of the disease than is commonly thought. It is not fair to assume that the changes affecting the remaining glomeruli are necessarily the same as those that occurred in the glomeruli that have disappeared.

Since it had been found that there was no correlation between kidney function during life and kidney weight after death, the next question was whether a relation did exist between kidney function and the number of remaining patent nephrons. Two commonly used tests of renal function, the urea clearance test of Möller, McIntosh and Van Slyke, and the maximum specific gravity or concentration test, were carefully carried out on a number of patients suffering from renal disease but without evidence of heart failure, and then the number of glomeruli was estimated at autopsy from a few days to several months later by the method just described.³

If the mean urea clearance, in percentage of normal, was plotted against the number of glomeruli per kidney, a reduction in clearance with a decreasing number of nephrons was apparent. The relation, however, was not a direct one, function being reduced more rapidly than the number of nephrons. In spite of considerable scattering, the points fell fairly well along an exponential curve concave upward. In contrast to this, when the renal mass had been reduced by subtotal nephrectomy in dogs, the percentage reduction in clearance was less than the reduction in glomeruli, so that the curve was convex upward.⁴ In the dogs the remaining glomeruli were normal, while in the patients many at least of the remaining nephrons were more or less damaged. The pathologic changes may include not only a reduction in the area of filtering surface, but also a decrease in the permeability

of the glomerular membrane, so that there is less filtrate for a given filtering area and capillary pressure.

The concentration test is a sensitive, reliable and easily performed test of renal function; but it is well known that the specific gravity of the urine may reach a minimum value of about 1.010 while the patient is still free from symptoms, and that with further progress of the disease, no further reduction in specific gravity occurs. Alving and Van Slyke⁵ compared the urea clearance and concentration tests and found that both were equally good until the specific gravity of the urine had fallen to 1.010, which occurred when the value for the urea clearance had reached about 35 per cent of average normal. After this the clearance test alone showed the progress of the disease. These facts are confirmed by a correlation of the maximum specific gravity and the number of glomeruli. The shape of the curve is different from that afforded by a correlation of the urea clearance value and the number of glomeruli. It is approximately a horizontal line up to between 700,000 and 800,000 glomeruli per kidney, and then it rises at an angle of about 45° to the normal range. The point of apparent discontinuity, about 700,000 or 800,000 glomeruli per kidney, corresponds to about 35 per cent of normal urea clearance. The reason for this apparent discontinuity invites speculation. It may correspond to the point at which all the remaining glomeruli become continuously active.

There is little correlation between the systolic blood pressure and the estimated number of glomeruli, except that no patient was encountered with less than 700,000 glomeruli per kidney who had a systolic pressure below 150 millimeters of mercury. On the other hand, a person with a normal number of injectable glomeruli may have an elevated blood pressure. The data on hand, however, at least suggest that when the glomeruli have been reduced to 700,000 to 800,000 per kidney, there is some change associated with the presence of elevated blood pressure and loss of concentrating power. It does not follow, however, that

these are causally related, for dogs in which Goldblatt and his co-workers had produced marked persistent hypertension by constriction of the renal arteries retained a normal urea concentrating power, and some dogs in which hyposthenuria had been produced by subtotal nephrectomy showed no significant rise in blood pressure.

While it might be possible to explain the increased volume of dilute urine passed in chronic Bright's disease on the basis of flood diuresis resulting from the elevated capillary pressure and possibly increased blood flow through the remaining nephrons, the facts could be accounted for equally well if the remaining tubular epithelium had lost its concentrating power. The evidence on this point is indirect. If about half of one kidney is removed from a dog, and some weeks later the other kidney is excised, the animal puts out an increased volume of dilute urine, and the specific gravity is not raised significantly by the withholding of water for twenty-four or even forty-eight hours.⁴ Kidney function is reduced, blood urea level is elevated, and in some animals blood pressure is moderately elevated. With a reduced number of nephrons, lowered urea clearance and apparent loss of concentrating power, the renal function of these animals simulates that of chronic nephritis. Injections of pituitrin and adrenal cortical extract, and the administration of a diet rich in protein had no effect on the specific gravity of the urine. When, however, the concentration of plasma protein was raised by severe dehydration or by the injection of concentrated plasma, the animals excreted a small volume of urine with a specific gravity as high as during the control period before operation. The increase in concentration of plasma protein presumably diminishes effectual pressure in the glomerular capillaries, resulting in a smaller volume of glomerular filtrate and consequent better opportunity for reabsorption of water by the tubular epithelium. Urine of high specific gravity was also obtained when blood pressure was lowered to just above the critical level by spinal anesthesia. Here

again, the mechanism is probably dependent on a smaller volume of filtrate. Since it is hard to believe that either of these procedures would suddenly restore abnormal tubular epithelium to normal, it seems fair to assume that the hyposthenuria was due to changes in blood pressure or flow, or to changes in the composition of the blood, rather than to abnormality of the tubule cells. A few observations of the effect of lowered blood pressure on patients suffering from chronic nephritis are consistent with this. Both Christian and Mosenthal have commented that a patient who has had hyposthenuria for a long period may excrete urine of high specific gravity before death. I have confirmed this finding, and found that it occurs when systolic blood pressure falls to 70 to 90 millimeters of mercury and is maintained at this level for some hours. Patients with systolic blood pressures of 150 to 220 millimeters of mercury who did not excrete urine of higher specific gravity than 1.009 and 1.010 (corrected for any protein present), have, when blood pressure fell to near the critical level, excreted urine having a specific gravity of 1.015 or 1.018. No opportunity has yet been presented to study the effect of increased concentration of plasma protein. Pituitary extract is without effect on the patient suffering from chronic nephritis, as it is on the dog with subtotal nephrectomy.

The composition of the urine, that is the contribution to the total specific gravity of urea, chloride, sulphate, et cetera, is usually the same in chronic nephritis as in the normal subject. It is simply more dilute.

SUMMARY

Chronic nephritis, including glomerulonephritis, arteriolar nephrosclerosis, and pyelitis, is characterized by a reduction in the number of kidney units or nephrons. Large numbers of destroyed glomeruli may completely disappear, without leaving recognizable scars.

Kidney function, as measured by the urea clearance or maximum specific gravity test, correlates better with the number of remaining nephrons than it does with kidney weight. While qualitative changes in the

tubular epithelium of the remaining nephrons cannot be excluded, it seems probable that the characteristic increased volume of dilute urine in chronic nephritis may be in the nature of a flood diuresis through a small number of nephrons, mediated through changes in the composition of the blood, in the calibre of vessels, or in blood flow.

The progressive destruction of nephrons in all of the more common types of chronic nephritis accounts for the similarity of symptoms in the late stages. A differential diagnosis may be impossible in the absence of an accurate history of the onset and course of the disease. Even the histologic appearance of the kidney may be less helpful than is commonly believed, since destroyed glomeruli completely disappear, and it is not justifiable to assume that those remaining necessarily show the same type of pathologic process.

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THE TREATMENT OF ANURIA*

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Every sensitive physician knows that invisible but powerful forces are at work in each sick room he visits. These forces, emanating from the patient and his family, constitute a demand for action on the part of the physician which may at times be almost irresistible. In an emergency this urge may be so great indeed that any action

taken by the physician, no matter how aimless or harmful it may really be, is eagerly offered and gratefully received.

Abrupt cessation of urinary flow always presents an imperative call to action and there are many ways in which the physician may respond. Under current practices he is tempted to meet the challenge with the infusion needle or the scalpel through the renal capsule, but other and possibly saner courses of action are also open to him. He may, for example, arrive at the difficult decision that it is wiser to do virtually nothing at all.

It is conventional to deal with the problem of anuria first by offering a classification which is supposed to pigeonhole the various types in a clear-cut convenient form, but our knowledge of renal physiology is changing so rapidly that any rigid approach seems ill-advised. It is apparent, however, that anuria is always due to *glomerulotubular imbalance* and may thus be divided into two main categories.

ANURIA OF GLOMERULAR ORIGIN

Diminution in the rate of glomerular filtration is due to reductions in the rate or pressure of glomerular blood flow. Hypofiltration and oliguria are therefore constant features of any circumstance which deviates blood from the kidneys, and the renal vasoconstriction which accompanies peripheral circulatory failure from any cause may be so intense as to produce anuria and permanent renal damage.¹⁻⁴ The reduced urinary volume which follows severe physical exertion, congestive heart failure, trauma, hemorrhage, burns, dehydration, the hepatorenal syndrome, and certain infections, is probably always initiated by renal ischemia. Prolonged ischemia causes tubular lesions which may not be reversible.

Recently, Trueta and his colleagues⁵ described a phenomenon characterized by renal ischemia limited to the cortex which, if confirmed, may clarify certain discrepancies known to exist between renal blood flow and urinary formation. For many years observers have occasionally noted that red blood could be seen leaving the

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kidney through the renal vein at a time when urinary formation was greatly diminished. Utilizing perfusion and radiographic technics, Trueta's group showed not only that the combination of cortical pallor, oxygenation of renal vein blood, and anuria could be produced by various means, but that this phenomenon was caused by the redistribution of blood from the cortex to the medulla of the kidney. Their explanation is based on certain anatomic differences between the familiar glomeruli in the more peripheral portions of the cortex and the less numerous *juxtamedullary* glomeruli in the more central portion of the cortex. The peripheral glomeruli through which the blood supply of the kidney normally flows are equipped with efferent arterioles which are relatively small in caliber and which lead by multiple branches into the vast system of peritubular capillaries; the efferent vessels of the *juxtamedullary* glomeruli, on the other hand, are much larger and they lead directly into the relatively capacious loops of the vasa recta and the interlobular veins. It is claimed that these medullary channels are large enough to accommodate the entire renal blood flow, and that the transfer of blood from the cortical to the medullary circuit may be produced by the action of certain hormones, by stimulation of the renal nerves, by hemorrhage and by tourniquet shock. Bilateral cortical necrosis has even been produced by the intravenous administration of staphylococcic toxin.

The implication of these observations is far-reaching. If blood entering the kidney through the renal artery can traverse the kidney by one of these two routes or by a combination of them in varying degree, the interpretation of renal clearance tests becomes difficult, and current concepts regarding the action of diuretic and anti-diuretic drugs must certainly be revised. It must be noted, however, that most observers⁴ have found the total renal blood flow in shock to be reduced rather than increased. It is too early to evaluate Trueta's claims accurately but it seems probable that this mechanism for redis-

tributing blood within the kidney is not too important in the human at least.⁶ The existence of these medullary channels has been known for many years. They undoubtedly offer less resistance to the flow of blood than do the cortical vessels but the circumstances under which they are called into play and the degree to which they are able to maintain total renal blood flow remain to be established.

Glomerular anuria is also occasionally encountered, of course, in acute glomerulonephritis, but this condition should be recognized by standard clinical methods. No means of altering the swelling and proliferation of the glomerular endothelium is known at the present period. Diuretics are obviously useless, and the ingestion of salt and water should be sharply limited until the vascular reaction subsides.

Treatment: Since the persistence of shock for only a few hours is apt to produce chronic renal failure, it is urgently important to combat peripheral circulatory collapse by any means which seem appropriate. Except in those rare instances in which shock is due to failure of the heart rather than to diminished blood volume, these will include prompt and adequate transfusion of whole blood. Since acidosis is not likely to be severe in the early phase of shock, the parenteral use of alkali in this stage is not usually needed. Even if hemoglobinuria indicates the existence of a transfusion reaction, the administration of base for the purpose of alkalinizing the urine is unlikely to accomplish this end and may produce severe metabolic alkalosis.⁷ The use of high spinal anesthesia or splanchnic procaine block is not justified on the basis of available evidence.

ANURIA OF TUBULAR ORIGIN

Acute toxic nephrosis seems a less cumbersome term than "lower nephron nephrosis"⁸ and is more accurately applied to those cases of anuria in which nephrotoxins may be suspected of playing a role. Since renal ischemia undoubtedly produces degenerative changes in the tubules, and since circulatory changes also undoubtedly complicate the picture of tubular poisoning, it

is often not possible to distinguish sharply between these two types of renal damage. Dehydration, electrolyte imbalance and shock only too commonly accompany any process apt to damage tubules directly.

Among those agents thought capable of producing direct degenerative lesions of the convoluted tubules the most frequent are anoxia, heme pigments (hemolytic crises), heavy metals (mercury, bismuth, arsenic, uranium), sulfonamides, carbon tetrachloride, alcohol, mushrooms and tissue extracts. All these probably diminish urinary volume by destroying the capacity of tubular epithelium for the selective reabsorption of glomerular filtrate because Richards⁹ directly demonstrated that the glomerular circulation of frogs poisoned with bichloride of mercury is entirely adequate at a time when no urine is issuing from the ureter.

From the standpoint of prognosis it is important to remember that the renal tubules possess great capacity for regeneration and repair. Complete restitution of structure and function is to be expected if exposure to the noxious agent is not extraordinarily intense and if the patient survives the period of immediate dysequilibrium.

Treatment: It has been pointed out that anuria of glomerular origin quickly assumes the characteristics of that due to tubular dysfunction. Except, therefore, for the measures needed to prevent and combat early shock, treatment of both varieties should proceed along identical lines.

Under any circumstances the mortality rate will be high but it can be appreciably lowered if efforts are made to prevent death from circulatory failure. Recently some much needed figures concerning the effect of anuria and fluid administration upon the total circulating blood volume have been published;¹⁰ in patients receiving more than 1000 cc. of fluid daily the average increase in blood volume was more than 40 per cent, and it was about 20 per cent even in those who were given less than this amount of liquid. These figures explain the high incidence of death from pulmonary

edema and illustrate the dangerous futility of attempts to initiate diuresis by fluid administration. Estimates concerning the daily requirement of normal man for physiologic saline vary from 300 cc.¹¹ to 700 cc.;¹² a compromise suggests that anuric patients need no more than 500 cc. of water and 4 Gm. of sodium chloride daily, unless vomiting, sweating, or diarrhea increases the demand. It is far better, and usually possible, to give saline orally in the form of low protein, high carbohydrate beverages.* If edema appears, sodium should be entirely eliminated from the diet. This rigidly restricted intake of fluid must be continued until spontaneous diuresis occurs, at which time the volume of fluid given may be adjusted daily to equal the volume of urine excreted. Since the clinical crisis usually terminates in recovery or death in about ten days, total caloric consumption may be largely disregarded, as may moderate degrees of acidosis and hypochloremia.

Sharp reductions in plasma carbon dioxide and chloride content should, of course, be corrected. If one wishes to give sodium bicarbonate parenterally for this purpose, the nomogram of Van Slyke⁴ is useful but the volumes of isotonic solution called for seem dangerously great for use in hydremic patients; a man weighing 170 pounds requires 6.5 liters of 1.3 per cent sodium bicarbonate to increase the plasma carbon dioxide from 15 volumes to 60 volumes per cent, if 0.026 Gm. of sodium bicarbonate per kilogram of body weight is calculated to raise the plasma carbon dioxide by 1 volume per cent. Whenever practical, it is safer to give sodium citrate orally in doses of 20 to 30 Gm. daily until the deficiency of base is met; if infusion is needed, sodium bicarbonate or sodium lactate may be given slowly in hypertonic solution (1-3 to 1-2 molar) in order to re-

*Miss Corinne Baker, Chief Dietitian of the Ochsner Clinic, devised the formula: 240 cc. medium cream, 2 eggs, 25 Gm. lemon juice, 100 Gm. lactose, one-half teaspoon sodium chloride, 0.5 cc. Vi-penta Drops (Roche). It is not unpalatable and supplies 20 Gm. protein and 1064 calories.

duce fluid intake. Molar sodium lactate in a dose of 10 cc. per kg. will increase the plasma carbon dioxide content by approximately 33 volumes per cent, an amount great enough to relieve the clinical signs of acidosis.

Urologists appear to rely heavily upon the intravenous use of sodium sulfate but it would be difficult to devise a remedy more likely to induce hydremia. Except in the presence of severe acidosis all fluids containing large amounts of sodium should be strictly prohibited, and this is one of the objections to transfusion since each unit of whole blood contains about 2 Gm. of sodium citrate.⁷ Transfusion may properly be used early in an effort to combat shock but red cells suspended in sodium-free solutions might be less disturbing if anemia requires treatment in the later (twelve to twenty-four hours) stages. The average patient will more often require venesection than transfusion, however, since this is the most certain way of relieving the heart overburdened by hypervolemia.

With the exception of analgesics and hypnotics there are no drugs useful in the treatment of anuria. Digitalis and aminophyllin lower venous pressure and thus improve the output of an overloaded heart¹³ but, in the absence of adequate renal function, are far less effective than bleeding in the management of pulmonary edema.

Nothing which is known about the physiology of the anuric kidney justifies decapsulation. Although there is no reason to deny that interstitial edema and cellular infiltration may accompany the acute nephrotic lesions seen in anuria, there is remarkably little information available concerning intrarenal pressure either in health or disease. Surgeons who decapsulate kidneys in the expectation of increasing urinary flow usually justify themselves by assuming that the operation either diminishes intrarenal pressure or that it denervates renal blood vessels. The latter hypothesis is manifestly untenable but the former theory may sound plausible because of numerous clinical assertions that anuric

kidneys often look swollen to the naked eye and that capsulotomy results in bulging of the parenchyma through the incision. In a recent review of this subject we¹⁴ were unable to find any recorded instances in which intrarenal pressure had been actually measured in man and, even more remarkable, only one attempt to make such a measurement in normal animals.¹⁵ We agree with Kugel¹⁶ that gross renal edema is probably due to the administration of the excessive amounts of fluid in such patients, and are inclined to place much more confidence in the descriptions of anuric human kidneys which were not swollen and which did not bulge after stripping of the capsule. A survey of the literature on decapsulation over the past twenty years allowed us to conclude only that surgeons do not often report their failures and that fewer patients die after unilateral than after bilateral decapsulation.

Although still in the experimental stage and unavailable to the profession at large, the "artificial kidney" promises to be of real aid in supporting the patient through the critical period required for tubular regeneration.¹⁷⁻¹⁹ Peritoneal dialysis presents a formidable technical problem largely because of infection,²⁰⁻²² and irrigation of the small intestines through a three-lumened tube has not yet reached the stage of clinical application.²³

CONCLUSIONS

1. Restriction of water and sodium intake is essential in the treatment of anuria if the mortality rate from circulatory failure is to be reduced.
2. Parenteral administration of fluid is potentially dangerous and seldom necessary.
3. Chemical denervation of the kidneys is not of proved value, and renal decapsulation is condemned.

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THE PRACTITIONER AND THE DIAGNOSIS AND TREATMENT OF HEADACHE*

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The subjective symptom of headache is perhaps the most common complaint of

those who seek help from the practitioner. Headache is, of course, caused by very many physical and mental disturbances. In a few types of headache the experienced physician will be able to make a correct diagnosis on the basis of a simple history and a brief, local physical examination. As we shall see, however, with many other kinds of headache such a course can readily lead to serious mistakes in diagnosis with consequent failure in treatment.

It is therefore evident that there is need for a careful, systematic diagnostic study of frequently recurring or chronic but severe headaches which temporarily or more permanently disable the patient. If the practitioner will devote the necessary time and effort to such a diagnostic study, many headache patients will avoid the necessity of going from doctor to doctor before securing relief.

We will exclude consideration of the simpler headaches which form only a minor part of many symptom complexuses of obvious cause and which are usually either mild or very temporary, and devote our time to a study of the cases in which headache is the chief symptom, or at least is one of the most marked complaints.

We will also exclude any mention of the several types of neuralgia of the head and neck. These are usually fairly localized pains, often of characteristic type, which are chiefly of purely nerve origin and distribution, in contrast to the more generalized head pain which we term headache.

THE PAIN-SENSITIVE STRUCTURES OF THE HEAD AND NECK

Recent studies of the pain-sensitive structures of the head and neck and of the mechanisms of production of a number of types of serious headache, made chiefly by Wolff and his associates, are of very great interest, and aid importantly in our understanding of the diagnosis and treatment of headache. They form the basis of a part of a diagnostic plan by which headaches may be studied.

These investigators made repeated and careful examinations to determine which of the structures of the head and neck are actually pain-sensitive. They studied par-

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ticularly the intracranial structures which had been exposed during various neurologic operations under local anesthesia, for sensitivity to various kinds of stimuli.

The essentials of their many reports are that (1) the tissues covering the cranium and adjacent to it are all more or less sensitive to pain; the arteries and nerves are especially sensitive. The structures of the face, neck and organs of special sense are all quite sensitive to pain. (2) The cranium itself including the diploic and emissary veins, the brain parenchyma, most of the dura, most of the pia-arachnoid, the ependymal lining of the ventricles and the choroid plexuses are all insensitive to pain. (3) Of the intracranial structures, the great venous sinuses and their tributaries from the surface of the brain, parts of the dura at the base of the brain, the dural arteries, and the cerebral arteries of the base of the brain, and the fifth, ninth, and tenth cranial nerves as well as the upper three cervical nerves are all sensitive to pain.

THE MECHANISMS OF HEADACHE

Wolff states that headaches may be divided into two main categories: those that arise mainly as a result of stimulation of pain-sensitive intracranial structures, and those occurring chiefly by stimulation of pain-sensitive structures on the outside of but adjacent to the skull. He points out that intracranial disease usually produces referred pain. Wolff clearly showed that stimulation of pain-sensitive structures on or above the tentorium cerebelli results in pain in front of a line drawn across the top of the head just in front of the ears. The pathways for the referral of such pain are contained within the fifth cranial nerve, so that it is felt over the area supplied by one or more of the divisions of the trigeminal nerve. Stimulation of pain-sensitive structures below the tentorium results in pain behind the line described. The pathways for the referral of this pain lie chiefly within the ninth and tenth cranial nerves and the upper three cervical nerves.

Six basic mechanisms have been postulated by Wolff and his associates as a re-

sult of their studies. These are that headache results from:

1. Traction on veins passing to the great venous sinuses within the skull, and by displacement of the sinuses themselves.

2. Traction on the middle meningeal arteries.

3. Traction on the large arteries of the base of the brain and their main branches.

4. Distention and dilatation of the intracranial arteries.

5. Inflammation in or about any of the pain-sensitive structures of the head and neck.

6. Direct pressure as by tumors on the cranial and cervical nerves which contain pain-afferent fibers for the head and neck, which have been named.

These authors point out that intracranial disease usually produces headache through more than one of these mechanisms acting at the same time, and by involvement of more than one pain-sensitive structure.

Wolff emphasizes that traction on, displacement, distention and inflammation of cranial *vascular* structures are chiefly responsible for the production of headache. This is in direct contradistinction to older beliefs that head pain, particularly intracranial headache was caused by changes in *nerve* structures almost exclusively.

THE PATHOLOGIC PHYSIOLOGY OF HEADACHE

Pfeiffer and his associates have pointed out that a disturbance in the hydrodynamic mechanism within the cranium accounts for the production of a majority of types of headache. The pain-sensitive dura, falx, tentorium and cranial blood vessels may be distorted by factors which disturb the normal relation between the brain volume, the cerebrospinal fluid pressure, the blood volume and the peripheral vascular tone.

Thus the brain volume is altered by tumors and abscesses, and possibly by toxins as in uremia to cause headache. The cerebrospinal fluid pressure is increased in spinal blocks as in meningitis, and in carbon monoxide poisoning, and decreased after spinal drainage, with headache. The blood volume is increased by such drugs as the nitrites and histamine, and is decreased in migraine, with headache. Peri-

pheral vascular tone is increased in hypertension and probably decreased in migraine, with headache.

THE RELATIVE FREQUENCY OF THE CAUSE OF HEADACHE

Although no two authors on the subject use quite the same classification, or agree fully as to the relative frequency of the various causes of disabling headache, the following order of frequency, comprising the ideas of Wolff and Moench, is one which we can use as a basis for our consideration of the individual types of etiology, so that we may discuss the diagnosis and treatment in orderly fashion.

1. Psychogenic headache of emotional origin; Moench considers this to be the most common of all causes for headache; we will consider it last.

2. Migraine.

3. With pathology in the structures of the neck, either sustained muscle spasm, now generally called myalgia due to a variety of causes, or to actual arthritis of the cervical spine.

4. With systemic disease with fever or toxemia or hypertension.

5. In nasal and paranasal sinus disease.

6. In ocular disease.

7. With intracranial pathology.

8. Histamine headache.

MIGRAINE

Typical, true migraine is thought to be the most common cause of temporary if recurrent incapacity due to headache. It has been estimated that as many as eight million people in the United States suffer from migraine in mild or severe form. It usually starts before the age of thirty-five years and may be seen in children. It tends to affect the upper class of educated and intelligent people most often. Heredity plays a role in 50 per cent of the cases and there is a definite allergic background very often.

It is a periodic headache, usually uni-

lateral at onset, but becoming more generalized later. It is associated with irritability, nausea and vomiting, constipation or diarrhea, and in about 10 per cent of cases is ushered in by "fortification" scotoma, photophobia or hemianopsia. Each attack lasts for several hours to several days and there may be euphoria between seizures.

Wolff and his associates have demonstrated the actual mechanism of the pain in true migraine to be an increase in the amplitude of the pulsations of the extracranial arteries, chiefly the branches of the external carotid artery, by vasodilatation and consequent stretching. The pain is thus extracranial and vascular in origin. Wolff believes that in addition there is prolonged contraction of the muscles of the neck and scalp as in myalgia, along with a transient edema of the walls of the distended carotid arteries. He considers that these two factors prolong the headache after the vasodilatation passes, and explain the failure of relief seen when vasoconstrictor medication is given late in the attack. He believes the cause of the prodromal scotoma and other cerebral changes to be an early and very transient vasoconstriction of cerebral vessels.

The diagnosis of the typical form of true migraine rests on the presence of what Moench considers to be four classic components, any one of which may predominate or be absent. These are (1) headache, typically a severe hemicrania; (2) gastrointestinal disturbance, usually with nausea and vomiting; (3) visual disturbance preceding the pain, the scintillating scotoma being characteristic; and (4) history of a familial tendency to the same type of headache, very often with an allergic background. With these findings one can make a diagnosis of true migraine with reasonable certainty. (Table 1).

TABLE 1. DIFFERENTIAL DIAGNOSIS OF HEADACHE (Modified from Moench)

	MIGRAINE	MYALGIA	CERVICAL ARTHRITIS	NEPHRITIS, UREMIA	HYPERTENSION	HISTAMINIC HEADACHE
Frequency	Very common; Women 2.5; 1 men	Very common	Fairly common	Not common	Common	Rare, in males
Age	Puberty to meno- pause; absent in pregnancy	Adults	Usually over 45	Any	Usually over 40	Over 50 years
Type	Always periodic	Periodic	Constant	Constant	Periodic	Always periodic
Onset	Abrupt or gradual	Gradual	Gradual, increasing	Slowly over days	Gradual over months	Very abrupt
Duration	Hours to days	Variable	Long lasting	Long lasting	Hours	Less than one hour
Location	Hemicrania, may become bilateral	Back of neck into scalp	Neck into occiput and shoulders	General over head	Fronto-occipital	Temporal hemicrania
Character	Boring, throbbing, mild to severe	Aching with stiffness	Steady with sore- ness and stiffness	Dull	Throbbing	Excruciating, boring
Time	Any, especially with menses	Seldom wakens	Early morning	Any	Daily, wakens in morning	Wakens after short sleep
Posture and Activity	Worse lying down	Comfort with head held in hands	Cough, strain, use aggravate	No effect	Disappears after rising	Erect posture often relieves
Occupation	Professional, mental workers	Holding head in same position	Use of neck and shoulders	Any	Any	Any
Personality	Rigid	Rigid, neurotic	Any	Any	Rigid, tense	Any
Light, Reading Noise, Travel	Aggravate pain	Aggravate pain	No effect	No effect	May increase	No effect
Lacrimation, Photophobia	May be present	None	None	None	None	Unilateral common on side of pain
Nausea, Vomiting	Nearly always	None	None	Very common	Very rare	Very rare
Myalgia of neck as complication	Quite common if pain prolonged		May be present	None	May occur	None
Miscellaneous	Scotoma, familial tendency; may be allergic history	Tender, stiff neck and scalp muscles	Crepitus; positive spinal X-rays	Signs of causa- tive disease	Elevated blood pressure, etc.	Flushed skin, rhin- orrhea, tenderness of carotid artery on same side

Certain diagnostic tests have been developed which serve to aid materially in establishing the presence of true migraine and in differentiating it from migranous headaches due to several causes which we shall consider in a moment. During the pain, inhalation of amyl nitrite will bring on a sharp increase in the discomfort. In the intervals between attacks, 1/50 of a grain of nitroglycerine under the tongue will cause a brief hemicrania in migraine subjects. During the attack, inhalation of pure oxygen for a time will often relieve the pain. Most characteristic is the effect of a hypodermic of ergotamine tartrate, 0.25 to 0.5 cubic centimeter, which usually brings prompt, often dramatic relief of pain. (Table 4).

TABLE 4. DIAGNOSTIC TESTS USEFUL IN DIFFERENTIATION OF MIGRAINE IN INTERVAL BETWEEN ATTACKS:

Histamine injection	May cause brief headache
Amyl nitrite inhalation	May cause very brief headache
Nitroglycerine 1/50 grain under tongue	Will often cause headache

DURING ACUTE ATTACK:

Ergotamine injection 0.25 to 0.5 cc.	Will usually stop pain
Trichlorethylene inhalation	Will often stop pain for a time
Intravenous epinephrine 0.1 cc. 1/40,000	May stop pain
Inhalation 100 per cent oxygen	May stop pain

Typical migraine may be mimicked by at least three types of migranous headache. These occur (1) with hypertension, (2) with organic disease of the central nervous system, and (3) as headaches of emotional origin. All three of these may be marked by attacks of headache, often a hemicrania, but the other characteristics of true migraine are present in minor degree if at all. The diagnostic tests described usually give equivocal results and aid greatly in differentiation; the use of ergotamine

in particular usually has little or no effect on migranous head pain.

These migranous headaches will be discussed under their appropriate headings. That they occur quite frequently, give rise to diagnostic problems and require quite different treatment from true migraine, clearly points to the need for the diagnostic study already advocated.

The actual cause of the vasodilatation of the cranial arteries which produces the headache in true migraine is probably most often an allergy, nearly always to one or more foods. The diagnostic study of true migraine hence should include skin tests, avoidance of suspected foods, or elimination diets.

The treatment of true migraine lies well within the province of the practitioner. The most important part of the treatment of the acute attack is the use of vasoconstrictors such as ergotamine tartrate by hypodermic or intravenous injection. As early in the attack as possible 0.25 to 0.5 cubic centimeters are given and repeated if the pain recurs. Tablets of 1 milligram by mouth are not nearly so effective. Ergovinine and dihydroergotamine are newer preparations with similar action. The treatment of the underlying allergy is necessary to prevent recurrence of the attacks. This is accomplished by elimination of foods causing symptoms, and the use of the antihistamine drugs.

HEADACHE WITH PATHOLOGY IN THE NECK

One of the most common causes of headache is hypertonicity of the posterior neck and scalp muscles, now usually termed *myalgia*. Pain in the back of the neck and into the head may also be caused by cervical *spinal arthritis*, by inflammatory *fibromyositis* of the nuchal fascia and muscles, and by occipital *neuralgia*.

Myalgia is the most common cause. It occurs as a primary condition of an occupational nature in those whose work requires that they keep the head and neck in fixed positions for long periods as in reading, writing and typing, accounting, sewing, etc. Wolff and his associates have also clearly demonstrated by means of myo-

grams of the posterior neck and scalp muscles that sustained contraction occurs in histamine headache, in spinal drainage headache, with irritation of the conjunctiva, and in prolonged contraction of the extraocular muscles, in painful nasal sinusitis, and even in migraine, and that it is especially common in the tension headache of emotional or psychoneurotic origin. Myalgia is thus a common contributing cause to headache of other primary origin. One could readily term this form of it a reflex myalgia.

In myalgia there is pain, soreness and tightness due to actual spasm in the back of the neck and scalp, with tender spots and local indurations on palpation of the trapezius and other muscles. The actual cause of the painful spasm and induration in the muscles in the absence of any reflex causes has been thought by Williams to be due to physical allergy, as to cold, associated with the formation of excess histamine and with prolonged vasoconstriction in the muscles, and the pain is carried by sympathetic nerve tracts.

The diagnosis is made by palpating the tender and indurated muscles of the neck and scalp. The pain can be very rapidly relieved by the injection of 1 per cent procaine into the point of greatest tenderness. This constitutes a diagnostic test which not only clearly points to myalgia as the source of the headache, but is of marked therapeutic value as well. (Table 1).

The treatment of myalgia comprises local heat and massage to the posterior neck muscles, with the procaine injection mentioned. Collar immobilization may be required in resistant cases, and a change in posture and work habits is usually necessary. When the hypertonic muscles are due to a reflex from the other sources mentioned they must be treated; psychotherapy directed toward the relief of physical and psychic tension is particularly important. With the idea that physical allergy plays a part in the cause, vasodilator drugs such as nicotinic acid and the antihistaminic

agents may be used in an effort to prevent recurrence of the condition.

Neck and head pain, usually occipital, is seen with arthritis of the cervical spine in middle and older ages. The pain in the head, neck, and shoulder is aggravated by marked motion of the spine and by straining or coughing. There is local stiffness, tenderness, pain on stretching, and sometimes crepitus; the diagnosis is confirmed by radiographs of the cervical spine. The treatment is similar to that for arthritis of other areas, and is well managed by the practitioner.

HEADACHE WITH SYSTEMIC DISORDERS

Headache is a symptom of many systemic disorders; it may be merely a mild annoyance or be a signal of serious disease. Wolff does not consider that pain in the head due to disease elsewhere in the body can occur, except with fever and hypertension and in rare cases of angina pectoris which have pain in the neck. He could not demonstrate other mechanisms which he could believe might cause headache. Moench, from the standpoint of the internist, calls attention to many systemic conditions with headache, in which actual cause and mechanism are often obscure. He believes that myalgia, variations in blood volume and in intracranial vascular tension may readily play significant roles in the production of these headaches:

Moench lists some of the more common causes of headache in systemic disorder as (1) alkalosis in alkaline medication for gastric ulcer; (2) with fever, in which Wolff and his associates have shown that the mechanism is like that in histamine headache and is due primarily to distention of intracranial arteries; it is seen in many acute infections, in sepsis and bacteremia; (3) glomerulonephritis, probably because of toxic metabolites or disturbance of intracranial hydrodynamics; (4) in uremia, possibly due to hypertension, disturbance of intracranial circulation, direct meningeal irritation or actual edema of the brain; (5) in arterial hypertension in which Wolff and his co-workers have demonstrated that the mechanism is like that in migraine, and

pain arises chiefly by dilatation and distention of certain branches of the external carotid arteries; he points out that this type of headache usually bears no direct relationship to the level of the blood pressure or to the pulse pressure although the phenomena are related; (6) in hypoglycemia when the blood level reaches 60 to 90 milligrams per cent; (7) in cerebrospinal syphilis. He points out that either organic or functional gastrointestinal disturbances rarely cause headache despite wide belief to the contrary. He also considers that constipation is a rare cause of headache; there is a large psychogenic factor in headache associated with constipation, conditioned by training and present day propaganda for laxatives; the old idea of auto-intoxication has been largely abandoned as unproven. Emotional tension usually leads to sympathetic overaction with parasympathetic inhibition, and spastic constipation is an incidental; headache also arises because of the psychic disturbance.

Migranous headache seen with hypertension is probably largely based on psychic tension. Moench points out that both hypertension and migraine tend to occur in the same type of tense, rigid personalities, with a similar hereditary factor, and that the mechanism in both is dilatation of the external carotid arteries and branches, though this is of quite different origin. Vasoconstrictor drugs relieve true migraine, but make hypertension headache worse; they should be used with great caution in the latter disease. Vasodilator drugs tend to relieve hypertension head pain, and make migraine pain worse; these factors are important in differential diagnosis.

The diagnosis of the cause of headache in these systemic conditions is made on the history, the physical findings and necessary laboratory studies; the need for systematic study is of course obvious (Table 1). The treatment lies entirely within the province of the practitioner and must be directed toward the cause of both headache and systemic disease.

HEADACHE IN NASAL AND PARANASAL SINUS DISEASE

In contradistinction to the belief of most

layman and physicians "sinus" is not a common cause of frequently recurrent or chronic disabling headache. When it does occur it is in acute sinusitis; chronic, uncomplicated sinusitis rarely causes serious headache. Headache from frontal sinusitis is localized over the forehead, that of maxillary sinusitis is in the cheek and upper teeth, and that of sphenoid and ethmoid sinusitis is felt behind the eyes and in the vertex. Pain in the back of the head, the neck and into the shoulder is caused by sustained muscle spasm or myalgia, as a reflex from painful sinusitis.

The mechanism of nasal and sinus pain has been investigated by McAuliffe, Goodell and Wolff by applying painful stimulation without anesthesia in human volunteers and during operations under local anesthesia, to the nasal and paranasal structures, plotting the sensitivity and reference of the pain. They found that the mucosa of the approaches to the sinuses such as the ostium of the antrum and the nasofrontal duct were highly sensitive, the turbinates and upper parts of the nasal cavity less sensitive, and the mucosa within the sinuses of low sensitivity. Most of the pains were referred over the second division of the trigeminal and less over the first division.

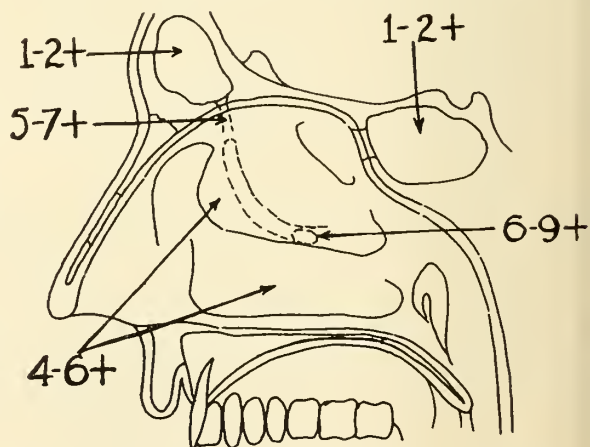


Figure 1. The relative pain-sensitivity of the nasal and sinus mucosa (McAuliffe, Goodell and Wolff).

They conclude that inflammation with engorgement of the turbinates, the superior nasal spaces and the sinus ostia are responsi-

TABLE 2. DIFFERENTIAL DIAGNOSIS OF HEADACHE (Modified from Moench)

	ACUTE SINUSITIS	CHRONIC SINUSITIS, VASOMOTOR RHINITIS	REFRACTIVE ERRORS, MUSCLE IMBALANCE	GLAUCOMA, IRITIS, ETC.	EMOTIONAL TENSION
Frequency	Not as common as supposed	Not very common	Quite common	Common when disease is present	Most common cause of headache
Age	Any	Any	School age, young adults and over 45	Any, usually adults	Usually adults
Type	Periodic daily	Periodic or constant	Periodic	Constant	Periodic or constant
Onset	After head cold	Gradual	With use of eyes	Usually gradual	Any type
Duration	Hours to end of day	Days to weeks	Hours, absent after sleep	May be acute or chronic	Hours, days, months, years
Location	Over involved sinus; referred to temple or vertex only	Frontal, temporal, orbital	Frontal, temporal, about or in eyes	In eye, frontal, temporal	Any, usually fronto-occipital and bilateral
Character	Throbbing	Dull ache, pressure	Dull, slowly increasing	Dull to severe, localized	Pain, tightness, feeling of band, cap, pressure, etc.
Time	Begins after rising, subsides afternoon	During day	Begins or increases at end of day	Worse in night	With and after emotional states
Posture and Activity	Stooping, jarring sharply aggravate	No effect	No effect	Aggravate pain	No effect
Occupation	Any	Any	Using eyes	Any	Any
Personality	Any	Any	Any	Any	Tense, anxious, psychoneurotic
Light, Reading, Noise, Travel	Aggravate	No effect	Distinctly aggravate	Aggravate	Aggravate, but diversion helps
Lacrimation, Photophobia	Usual, mild, with severe pain	None, except due to allergy	Usual but mild	Mild to severe	Weeping only
Nausea, Vomiting	Never	None	Very rare	With severe pain	May occur
Myalgia of neck as complication	Very common, causes occipital and neck pain	Uncommon	Very common, causes occipital and neck pain	May occur if pain prolonged	Almost the rule, causes occipital and neck pain and soreness
Miscellaneous	Respiratory infection precedes; pus in nose and sinuses	Allergic attack or head cold precedes	Errors of refraction or muscle imbalance found	Signs of eye inflammation, high intraocular tension	Many other symptoms and signs of psychoneurosis

ble for most of the pain in nasal and sinus infection and that headache not associated with these changes is probably not due to nasal or sinus disease. Zygomatic, frontal, cheek, temporal or vertex headache not greatly reduced in intensity or eliminated by application of vasoconstrictor and weak anesthetic medication within the nose is almost certainly not due to nasal disease. This constitutes a therapeutic test of great diagnostic worth.

The diagnosis of headache due to nasal and sinus disease is made on the history of a preceding acute upper respiratory infection, the presence of turbinate congestion and pathologic secretion on examination of the nose with the head mirror and reflected light, the results of transillumination of the frontal and maxillary sinuses and the results of shrinking and mild anesthetization of the nasal passages (Table 2).

Mild forms of nasal and sinus infection are readily treated by the practitioner with nasal vasoconstrictors, coal tar sedatives, local heat and chemotherapy. In severe, resistant or obscure cases the patient with headache due or probably due to sinus infection should be referred to the otolaryngologist.

HEADACHE DUE TO OCULAR DISEASE

Pain is often associated with intraocular disease such as glaucoma, iritis, choroiditis, etc.; it is usually localized at first, later spreading over parts of the area supplied by the first division of the trigeminal nerve. Such organic disease of the eye is readily discovered by careful external and internal examination of the eye, with a recording of the intraocular tension; simple palpation will serve the practitioner.

Headache is commonly believed to be due to "eye strain", and there is often headache associated with anisokonia, excess accommodation or convergence, hypermetropia, astigmatism, muscle imbalance and unequal myopia, in which the pain is probably due to spasm and fatigue of the ciliary and/or extraocular muscles, analogous to myalgia. In many such cases, there is a large additional factor of myalgia of the

posterior neck and scalp muscles from holding the head in a strained and fixed position, in efforts to produce distinct retinal images or binocular fusion. Wolff showed that both conjunctival irritation and extraocular muscle strain causes myalgia.

The diagnosis of headache due to these more obscure ocular conditions is made on the history of pain brought on by and increased with use of the eyes, located about the eyes, radiating to the brow or occiput as the day goes on, and usually bilateral and symmetrical. Local ocular symptoms and signs are also commonly present (Table 2). Exact diagnosis calls for a complete examination of the eye, and it is best to refer these patients to the ophthalmologist, since he will also supply the necessary treatment.

HEADACHE WITH INTRACRANIAL PATHOLOGY

Moench believes that intracranial disease causes about 5 per cent of all chronic headache, and that while the neurologic causes of such headache are few, they are important. Brain tumor causes about one death in every two hundred; no patient with persistent headache should be dismissed before the possibility of brain tumor has been carefully investigated.

The neurologic causes of headache are (1) brain tumor; (2) intracranial vascular disease such as thrombosis, embolism, hemorrhage, syphilitic arteritis and aneurisms; (3) intracranial inflammations such as meningitis, encephalitis and brain abscess; (4) post-concussion head injuries; and (5) a temporary form after spinal puncture, spinal anesthesia, ventriculography or encephalography.

The mechanism of headache in brain tumor, according to the investigations of Wolff and his associates is not increased intracranial pressure per se, but it is due to traction on or direct irritation of pain-sensitive intracranial structures, chiefly the large arteries, veins and venous sinuses of the brain, and certain cranial nerves.

TABLE 3. DIFFERENTIAL DIAGNOSIS OF HEADACHE (Modified from Moench)

	BRAIN TUMOR	MENINGITIS	BRAIN ABSCESS
Frequency	Causes 1 in 200 deaths	Uncommon	Quite uncommon
Age	Any	Any	Any
Type	Constant	Constant	Constant, varying
Onset	Gradual	Abrupt	Gradual
Duration	Prolonged	Prolonged	Very prolonged
Location	Local or referred	Occipital or generalized	Local or referred
Character	Dull or severe, boring	Throbbing	Dull ache
Time	Worse at night	Any	Any
Posture and Activity	Changes aggravate	Changes aggravate	May aggravate
Occupation	Any	Any	Any
Personality	May change	Acutely ill	May change
Light, Reading, Noise	Aggravate	Sharply aggravate	Aggravate
Lacrimation, Photophobia	May be present	May be present	Unusual
Nausea, Vomiting	Usual, may be projectile	Early and late	May occur late
Cranial nerve symptoms	May occur	Occur late	Occur
Papilledema	Common, late	Common, late	May occur late
Kernig sign		Strongly positive	
Fever, leucocytosis		High	High early and late
Spinal fluid changes	Occur	Very marked	Occur
Coma, somnolence	Late	Marked late	Usually late
Presence of suppurative focus		Very common	Very common

The diagnosis of probable brain tumor is made with a headache that is persistent and associated with repeated vomiting, and by the findings of a careful, routine neurologic examination. Findings will be uncovered which will indicate some intracranial lesion, and all such suspicious cases should be referred at once to the neurologist or neurologic surgeon for final diagnosis and treatment.

Intracranial vascular conditions causing headache will be discovered through the history, general physical and neurologic examinations, and the results of a spinal tap. These cases are usually very well treated by the practitioner. The diagnosis of meningitis is usually simple; when due to a

suppurative focus, the patient should be referred to the otolaryngologist for surgical treatment; the practitioner can be responsible for necessary general care, with chemotherapy or antibiotic treatment. Brain abscess occurs with a demonstrable focus in the nasal sinuses or mastoid cells, after skull fracture and with lung abscesses or pyemia (Table 3). Such cases should be referred to the otolaryngologist, the neurologic surgeon or both.

Headache following spinal drainage is usually transitory. The mechanism has been demonstrated by Wolff and his co-workers to be traction on, or displacement of pain-sensitive structures of the brain by the lowered spinal fluid pressure. They point

out that greatly increased pressure is neither a prime nor essential factor in the production of headache.

Post-concussion headache is diagnosed on the history. It is probably due to localized intracranial vascular or perivascular changes following the trauma. There is very often a large psychic element, especially when litigation, compensation or psychoneurosis is a part of the picture. In the latter case part or all of the pain may be due to myalgia of the neck and scalp muscles, which can be demonstrated.

The pain of epidural or subdural hematoma and subarachnoid hemorrhage after trauma is due to local tissue damage and pressure, and the diagnosis and treatment of such conditions is best put in the hands of the neurologist.

A migranous type of headache may be noted in many types of intracranial disease. The symptoms are not typical of true migraine, and the neurologic findings will make the cause clear; the diagnostic tests for migraine will yield incorrect results.

HISTAMINE HEADACHE: HISTAMINIC CEPHALALGIA

This is a rare entity which produces a most characteristic headache. It is apparently due to accumulation of histamine in the body, because of either overproduction or failure of destruction in some as yet unknown manner. Sensitivity to cold and other allergy may play a part. Schumacher and Wolff have shown that it is due to vasodilatation with stretching of the cerebral arteries of the base of the brain, the internal carotid, the vertebral and basilar arteries, and the proximal segments of their main branches.

The diagnosis is made on the history of acute attacks of sharp headache in later life, lasting less than an hour, usually awakening the patient after a short sleep, strictly unilateral in the eye, temple, face or neck, usually with watering and congestion of the eye, nasal stuffiness, increased skin temperature with sweating and tenderness over the external carotid artery or its branches. The pain is quickly relieved in the erect position and made worse by lying down (Table 1).

The diagnosis is established by producing a typical attack of pain by the subcutaneous injection of from 0.1 to 1.2 milligrams of histamine. The pain produced is at once relieved by the intravenous injection of 0.1 cubic centimeter or more of 1 to 40,000 solution of epinephrine. The treatment under the supervision of the practitioner is gradual histamine desensitization and the use of antihistamine drugs.

HEADACHE OF EMOTIONAL ORIGIN

This type of headache is also called tension or relaxation headache, psychosomatic or psychoneurotic headache; head pain is rare in true psychoses. It is extremely common, being perhaps the most frequent cause of all the types of headache. It is noted in hypochondriasis, hysteria, anxiety and conversion neuroses, obsessive-compulsive states, in simple acute worry and in post-anxiety conditions. The apparent cause is usually a combination of worry, physical fatigue or excitement in psychoneurotic personalities. The mechanism of the pain is very largely that of nuchal and scalp muscle hypertonicity and hence is myalgic. Neck and scalp muscle spasm and indurations are the somatic evidence of the psychic tension and should always be sought for.

The diagnosis is suggested by the history. These head pains are nearly always capricious, bizarre, and without special pattern as to time, location, duration, or exciting factors. The nature of the pain is often characteristic, as it is often described simply as discomfort, pressure in the head, feeling of a tight band or cap, etc. The total duration is also characteristic; organic headaches do not last for years or a lifetime without physical accompaniments. Exaggeration of severity is the rule. There are always additional psychoneurotic complaints of dizziness, sweating hands, globus, precordial pain, dyspnea, stomach "trouble", and back or pelvic pain (Table 2).

The diagnosis of headache due to emotional tension or true psychoneurosis is made on the history, and the failure to find any reasonable physical cause for the pain. This, of course, demands that there be a full diagnostic study to search for causes, such

as true migraine or myalgia of the neck which produce some part of the symptom complex, and which are amenable to proper treatment. It is also important that serious brain disease such as tumor, or systemic disease be discovered by a complete study, for obvious reasons. Every effort should be made to rule out all other causes for headache before the diagnosis of psychic pain is made. Treatment is by psychotherapy.

Moench points out that migranous headache of purely emotional origin is fairly common; a differential diagnosis from true migraine is necessary. Attacks of severe hemicrania, with nausea are seen in psychoneurotics of high intelligence of great nervous drive, who are of the tense and worrisome type and who are under emotional strain. The actual attacks take place when periods of such tension are followed by sudden changes in mood or program. Pain may occur with an increase in tension and restraint as by criticism, failure, domestic crises, etc., or by release from tension, during relaxation as on a holiday. The attacks only superficially resemble true migraine and characteristically are accompanied by obvious signs of marked emotional imbalance.

Treatment of these attacks comprises the use of such vasodilators as nicotinic acid or histamine, which are of variable action, and the use of barbiturate medication to allay tension.

All serious emotional problems with headache are usually best handled by referral to the psychiatrist, unless the practitioner is trained in psychosomatic technic and can devote the necessary time to the treatment.

CONCLUSION

It is surely evident from this rapid survey of the problem that the diagnosis and proper treatment of chronic or recurrent headache is usually anything but a simple matter. As has been repeatedly noted, a careful study of the whole patient by means of a systematic history, complete physical examination, diagnostic tests, and at times trials of one or more therapeutic tests is essential. In this plan, the practitioner

plays an important part. He can carry on much of the investigation and treatment, and serve as the co-ordinator for special studies which must be performed by specialists in some of the types of examination and treatment which most practitioners have not the time, equipment or training to do. He should be the key man in the study of headache.

With the view toward the orderly study of headache patients, an abbreviated outline for taking the history (Table 5), for making required physical examinations (Table 6), and for applying diagnostic and therapeutic tests is presented (Table 7). Much more complete information may be had by study of the publications of Wolff and his many associates and of Moench, in their books of recent issue.

REFERENCES

- Wolff, Harold G.: *Headache and other Head Pain*, Oxford University Press, 1948.
Moench, L. G.: *Headache*, Year Book Publishers, Chicago, 1947.

TABLE 5. OUTLINE FOR HISTORY TAKING IN DIAGNOSIS OF HEADACHE

OBTAIN ANSWERS TO THE FOLLOWING QUESTIONS:

1. Is the headache the only complaint? What other complaints are there in order of occurrence, severity and duration?
2. Is headache the most important symptom?
3. Where is the pain usually located exactly?
4. Does the pain radiate? If so, in what direction and extent?
5. When did the headache first occur?
6. If periodic, what is the usual frequency?
7. What is the duration of the pain?
8. At what time of the day does the pain usually occur?
9. What is the character of the pain? How severe is it?
10. Does the pain come and go quickly or gradually?
11. Do any of the following repeatedly bring on the pain? Physical exertion or work, change in posture, heat, excitement, worry or disappointment, menstrual periods, use of alcohol, excessive smoking, damp or cold weather, exposure to drafts, nasal stuffiness, cold in the head, swimming, use of the eyes, any particular drink or food, constipation.
12. Do any of the following repeatedly occur just before or with pain? Spots before the eyes, impairment of vision, nausea or vomiting, ringing ears, dizziness, watering eyes, burning and redness of eyes, stuffiness and running of nose, tender spot in face, neck or scalp, stiff neck muscles, toothache, chill, malaise, fever, fatigue.

TABLE 6. OUTLINE OF PHYSICAL EXAMINATION IN DIAGNOSIS OF HEADACHE

THE PHYSICAL EXAMINATION SHOULD INCLUDE:

1. Recording of temperature, pulse and respiration rate and blood pressure
2. Examination of the head for local lesions, tender spots, tender suboccipital, pre- and post-auricular lymph nodes
3. Examination of the neck for stiffness, tenderness, crepitus, spasm and induration of muscles, tender anterior and posterior lymph nodes
4. Complete examination of the eyes
5. Examination of the ears and mastoid processes
6. Examination of the nasal cavities and nasopharynx
7. Examination of the paranasal sinuses
8. Examination of the mouth, teeth, gums, tongue, pharynx, hypopharynx and larynx
9. General physical examination
10. Neurologic and/or psychiatric examination
11. Indicated laboratory tests such as urinalysis, blood count, Wassermann, blood chemistry, spinal fluid examination, etc.
12. Indicated radiographic examination of the skull, nasal sinuses, mastoids, teeth and jaws, cervical spine, etc.

TABLE 7. OUTLINE OF DIAGNOSTIC AND THERAPEUTIC TESTS IN THE STUDY OF HEADACHE

NOTE THE EFFECTS OF:

1. Inhalation of ampoule of amyl nitrite
2. Inhalation of ampoule of trichlorethylene
3. Nitroglycerine, 1/50 grain, under tongue
4. Prolonged inhalation of 100 per cent oxygen
5. Subcutaneous injection of 0.25 to 0.5 c.c. ergotamine tartrate
6. Subcutaneous injection of 0.1 c.c. or more of histamine
7. Intravenous injection of 0.1 c.c. of 1/40,000 epinephrine
8. Increasing doses of histamine by subcutaneous injection
9. Increasing doses of nicotinic acid by mouth or injection
10. Injection of 1 per cent procaine into tender spot in neck or scalp
11. Heat and massage to neck muscles
12. Change in work habits as to posture, lighting, etc.
13. Change in type of work, of living or work surroundings, or of climate
14. Use of nasal vasoconstrictor sprays or instillations
15. A trial of appropriate eye glasses
16. Elimination of suspected foods giving positive skin reactions or noted in food diary
17. Use of antihistaminic drugs
18. Proper treatment of any ocular, nasal, sinus, cervical spine, or neurologic condition found

19. Indicated specific treatment of any systemic disease found

20. Indicated symptomatic treatment of systemic disease when no specific exists

21. Psychotherapeutic treatment.

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THE PRESENT STATUS OF THE FENESTRATION OPERATION FOR OTOSCLEROSIS*

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Fenestration for clinical otosclerosis is one of the truly outstanding advances in otology in the past ten years. By fenestration we mean the modern one-stage operation developed by Lempert, on the basis of earlier work by Holmgren and Sourdille, and first reported by him in 1937. In the intervening years, while the basic concept of the procedure has changed scarcely at all, a number of surgeons have made important modifications in the technic. Among these are Lempert, Shambaugh, Meltzer, and others. It must be remembered that the operation is still undergoing changes and that the future will undoubtedly add more. Since some of the changes have resulted in very definite improvements in results, it seems that we can quite confidently expect that future modifications will solve the serious problems still to be faced before the operation can be considered to be perfected. The fenestration operation of Lempert has replaced all earlier types of surgical procedure and is now being performed all over the world. By it, with modifications, the results now being secured by many surgeons surely make clear to any informed or impartial observer that it does indeed mark a very great advance in otology.

It must be admitted that the operation has been much criticized, chiefly for two reasons. The changes in technic as announced from time to time have been understood by some to indicate a continued lack of successful results obtained by previous

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technics. We shall see that this is far from the truth. In the second place, it is true that the operation of the present day does not afford satisfactory results in every case. Nevertheless the reports of many surgeons make it evident that fenestration offers the hope to a large proportion of those who are seriously handicapped by deafness due to otosclerosis that the hearing will be restored to a useful level and obviate the need for a hearing aid.

One must remember that until ten short years ago there was no means of restoring the hearing of these individuals in the prime of life other than by the use of a hearing aid. No method of treatment, either medical or surgical, brought about sufficient improvement in the hearing to restore it to a practicable level.

THE DIAGNOSIS OF CLINICAL OTOSCLEROSIS

Clinical otosclerosis is that form of the disease in which progressive deafness of conduction type is produced by the growth of new otosclerotic bone about the foot-plate of the stapes in the oval window until it is ankylosed. Foci of similar new bone have been shown to exist quite frequently in other areas of the temporal bone by pathologic examination; this incidence may be as high as 20 per cent. These foci produce no known symptoms and their presence cannot be diagnosed.

The chief symptom of ankylosis of the stapes is the gradual onset and slow but sure progression of a typical conduction deafness. With this there may or may not be tinnitus; when this is present it may be mild or quite severe. The deafness is usually bilateral and is very often quite equal in the two ears. It may, however, begin in one ear and exist as a monaural deafness for a considerable time before the other ear is sufficiently involved to show deafness. The process may be much more advanced in one ear than the other, but the type of deafness is always the same in both ears.

Typical conduction deafness has the following well-known characteristics: (a) in the early stages of development of a progressive type, the loss for hearing of low

tones by air conduction is greater than that for high tones; (b) hearing by bone conduction is completely normal in the early stages; (c) in later stages, the losses for both low and high tones by air conduction are about equal; (d) hearing by bone conduction shows only mild loss even when hearing by air conduction is quite badly impaired; (e) the Rinne test is consistently negative until the progress of the disease is very far advanced.

Since clinical otosclerosis produces such typical conduction deafness it is evident that the diagnosis is made very largely upon the results of tests of the hearing. These should be made in a quiet room on at least two occasions. The spoken voice at an unaccented conversational level and the forced whispered voice will serve as the first coarse screen to indicate that there is sufficient deafness to warrant further study. The voice tests should be made in each ear separately while the other ear is masked by having the patient rub it with the flat of the hand. Voice tests are only a rough method, but since clinical otosclerosis typically causes losses below the 30 decibel level in the usual speech frequencies, voice tests are well worth while.

The next step in the screening process is careful and repeated testing of air and bone conduction with tuning forks. If the full set of forks from 128 to 2048 double vibrations is available, all should be used. Even if only one or two forks such as those of 512 and 2048 double vibrations are at hand, careful testing will usually give the examiner a very good clue to the presence of a conduction deafness as differentiated from a perception hearing loss.

These tests may seem laborious and time-consuming. There is one method which gives very accurate results and which is quite speedy. It is the performance of the Rinne test by the method of Fowler, Senior. Each fork is given a standard blow; the fork blades are first held one inch from the auditory meatus and the time noted, or a stop watch is started. The patient indicates that he hears the sound by raising a finger. The end of the stem of the fork is then

pressed firmly against the mastoid process over the antrum. The position of the fork is changed from meatus to mastoid and back every four seconds. When the patient indicates that he no longer hears the fork in one position, the elapsed time is noted. The fork is still changed until it is no longer heard in either position and the time is again noted. The duration of the hearing for each fork by both air and bone conduction is thus secured and can be compared, by one test.

In clinical otosclerosis it is characteristic that bone conduction is either quite normal, or that it is better than air conduction, and hence the Rinne test is definitely negative. This indicates a conduction type of deafness; if otoscopy fails to reveal the cause of such deafness by obvious changes in the external or middle ear, it is almost certain that clinical otosclerosis is present. When this is found, it is essential to secure an audiogram. This is of course the modern method of recording the hearing by both bone and air conduction through the normal frequency range, and of determining for certain that a conduction rather than a perception type of deafness is present.

The typical audiogram in early or mild otosclerosis reveals that the low tone loss by air conduction is greater than the high, and that the bone conduction is normal (Figure 1, a). In more advanced cases loss for low and high tones by air conduction is at about the same level; bone conduction is still normal or shows only mild losses

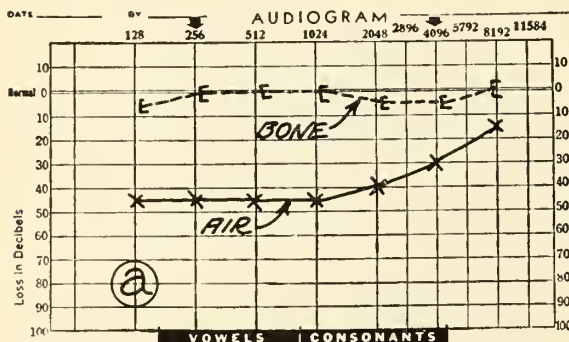
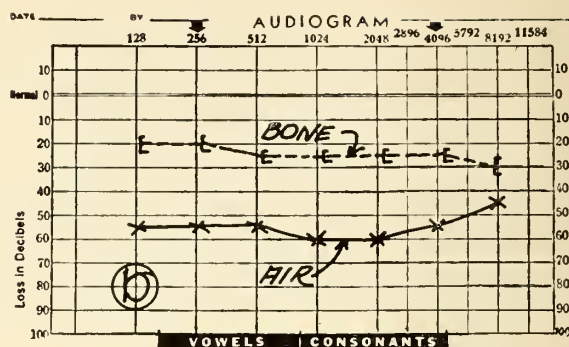


Figure 1. (a) Typical audiogram in early or mild otosclerosis.



(b) Typical audiogram in fairly well advanced otosclerosis.

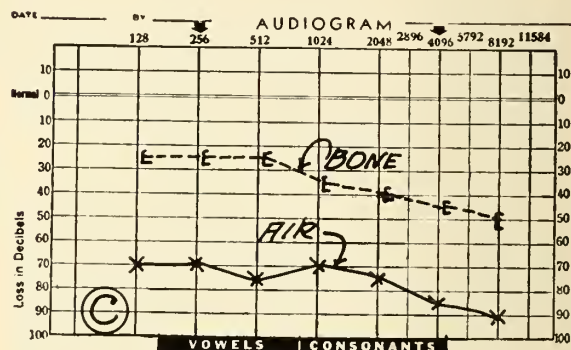
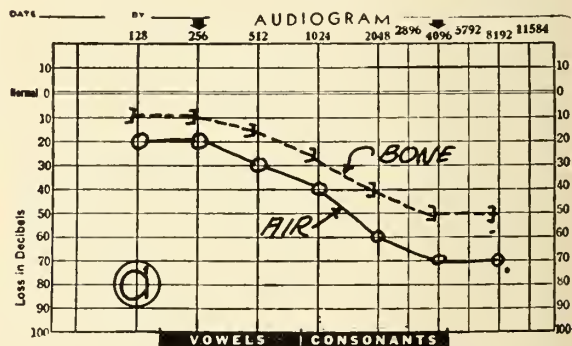


Figure 1. (c) Typical audiogram in far advanced otosclerosis.



(d) Typical audiogram in perception type deafness for which fenestration is absolutely contraindicated.

(Figure 1, b). When the deafness has existed for a long time, or when progress of the loss has been rapid, there will be a considerable loss for low tones, and an increasingly severe loss for high tones by air conduction, with a definite loss of bone conduction, usually most marked for the

higher frequencies (Figure 1, c). This latter type of audiogram is often seen in patients in middle life in whom the deafness has been present for twenty years; it may be noted in quite young patients whose hearing loss has been rapid and who have what is usually termed malignant otosclerosis, with a bad prognosis.

While the diagnosis of clinical otosclerosis thus rests largely upon the hearing tests, especially repeated audiograms, a complete history and physical examination are also necessary. The points in the history suggestive of otosclerosis are: (a) otosclerosis tends to occur in families; (b) it is far more frequent in women; (c) the deafness is usually bilateral and severe enough to handicap the patient before thirty years of age, since it probably begins at puberty; (d) paracusis in which the hearing seems better in very noisy surroundings is usually present; (e) a history of previous serious, prolonged or recurrent middle ear infection is usually not obtained; (f) tinnitus may or may not be present.

In the local physical examination the drums will usually be normal or show only the mild dullness and retraction so often seen without appreciable deafness. They may be very thin and brilliantly shiny. The pink blush of the congested promontory often described is only occasionally seen. Wide external auditory canals with little cerumen and diminished sensitivity are noted but are not characteristic. On inflation of the auditory tube it will be found to be normal. Mastoid radiographs will usually reveal a normal pneumatic structure, although partially or completely undeveloped forms may co-exist with otosclerosis.

INDICATIONS FOR FENESTRATION

Fenestration is indicated only in disabling conduction deafness due to otosclerosis; it is completely useless in perception deafness of any type (Figure 1, d).

It is now generally agreed that unless there is a deafness of 30 or more decibels in each ear through the speech frequency range from 256 to 2048 double vibrations, the disability is not sufficient to warrant

the operation. If the deafness is somewhat less than 30 decibels in one ear, it should be below this level in the deafer ear.

Since the object of the operation is to restore the hearing in the operated ear to the serviceable level or better, so that there is less than a 30 decibel loss through the speech frequency range, and since experience has shown that the gain that may usually be expected from the successful operation is of the order of 30 to 40 decibels, it is evident that binaural losses much greater than the 70 decibel level are almost certain to preclude a useful restoration of the hearing. Thus the maximum binaural loss suitable for operation is about 70 decibels through the speech frequency range.

The operation is indicated when the bone conduction hearing is normal or nearly normal through the frequency range from 512 to 2048 double vibrations. It will usually prove of doubtful success when there is any decided loss in bone conduction hearing; this means a loss of more than 30 decibels in one of these frequencies. The operation will usually prove unsuccessful when there is a bone conduction loss of 35 or more decibels in more than one of the frequencies from 512 to 2048.

THE CHOICE OF PATIENTS SUITABLE FOR OPERATION

From the foregoing indications it becomes evident that the patient may be considered as suitable for fenestration only when the requirements outlined are fulfilled. An *ideal case* in which restoration of the hearing to the serviceable level can be expected with very reasonable certainty is one in which bilateral hearing loss by air is 30 or more decibels but not more than 60 decibels, with normal or nearly normal bone conduction hearing, in good general health. The *suitable case* in which a satisfactory result is at least probable is one in which the binaural loss by air conduction is not greater than 70 decibels, and in which the bone conduction loss for the 512 to 2048 frequencies reaches but does not exceed the 30 decibel loss level. The *problem case* in which a favorable result is possible but not too likely to occur is one with

a binaural loss of air hearing greater than 70 decibels, with a loss in bone conduction greater than 30 decibels in one frequency from 512 to 2048 double vibrations.

CONTRAINDICATIONS TO FENESTRATION

As previously stated, fenestration is useless in perception deafness of any type. It is contraindicated in advanced otosclerosis when the air conduction loss is more than the 75 decibels and when the bone conduction loss at more than one frequency between 512 and 2048 double vibrations is greater than 35 decibels; in these patients the so-called cochlear reserve, or actual ability to hear even if the conduction of sounds were restored to normal, is so small that serviceable hearing can scarcely result.

Fenestration is contraindicated in the presence of dermatitis of the pinna or external canal, and in the presence of a chronic drum perforation of any type. Mere scarring of the drum from previous, long-healed otitis media is not a contraindication. The operation must not be done in the presence of active syphilis or tuberculosis, or in diabetes or chronic nephritis for obvious reasons. It should not be done in marked hypertension or with any blood dyscrasia which predisposes to capillary bleeding during or after the operation, since bleeding into the fistula in the labyrinth is almost certain to produce damage to the cochlea which causes further hearing loss.

The operation should be postponed when there is any suspicion of acute upper respiratory infection, especially with the slightest involvement of the auditory tube or middle ear.

PHYSICAL EXAMINATION

It is evident that when a patient is selected for operation on the basis of an accurate diagnosis of otosclerosis and an appraisal of the severity and type of hearing loss, a complete survey of the physical status is required before fenestration is offered. In addition to a careful otoscopy there should be an examination of the entire upper respiratory tract, inflation of the auditory tube, a general physical examination, a complete blood count with de-

termination of the clotting and bleeding time, a blood Wassermann and urinalysis.

In addition it is wise to make an estimation of the psychic status of otherwise suitable patients. Since not everyone will secure a fully satisfactory result even when he meets the physical requirements fully, or after securing a good increase in hearing, loses it again because of closure of the fistula, certain highly neurotic and very unstable types may have to be refused operation. Failure in these rather rare patients will bring about a mental depression of a severe nature. They do best when fitted with a proper hearing aid.

THE RESULTS OF FENESTRATION

Much criticism of the results of the operation has been expressed and sincere doubt brought to the minds of many physicians, both in and out of the field of otolaryngology, by several factors. It is freely admitted by all honest operators that a certain if quite small number of cases in which every known requirement is met and on whom a technically perfect operation has been done without any untoward event in the healing period, do not secure any appreciable improvement in hearing, or the improvement is too small to be of practical importance. These patients are considered to have had serous labyrinthitis due to the entrance of blood and tissue fluids into the fistula, during and after the trauma of creating the window into the labyrinth. Despite many efforts to prevent this occurrence, with considerable success, it cannot always be avoided. It is thus one of the unsolved problems of fenestration.

In a second, much larger group of fully suitable cases operated on with perfect technic in the light of present day information, an excellent early result is followed after weeks or months by a swift or more gradual loss of hearing until it returns to the preoperative level. This is due to regeneration of new bone which completely fills the fistula and again prevents the sound waves from entering the membranous labyrinth. This constitutes the greatest problem of fenestration. Thus far, despite much thought and study and a considerable

amount of animal and human experimentation, no certain means of preventing this bone regeneration has been found. It is the sincere hope of all that continued investigation will finally yield a method of controlling bone regeneration. This will mark a forward step secondary in importance only to the initial development of the operation itself.

It must be pointed out that such bone regeneration does not always occur by any means. It is not the rule and newer technics have steadily lessened its incidence. It does occur with sufficient frequency to be a great disappointment to both patient and surgeon.

Thus far the chief method of procedure when regeneration of bone closes the fistula has been by revision. By a short and simple second operation the fistula area is exposed and a new fenestra is created. This may be done more than once if it is followed by a reasonably long period of satisfactory hearing, in the hope that ultimately bone regeneration will cease. It is not uniformly successful however, as it is followed by useful hearing in only a moderate percentage of patients. It does not supply a satisfactory answer to the problem of fistula closure.

Finally, doubt as to the results actually being secured even by the leading surgeons performing many fenestrations has been created by a most unfortunate tendency for dissention among them over the manner in which results have been assessed, especially in quoting percentages of successful and unsatisfactory cases. There has been a further, if understandable uncertainty created by some leading surgeons who, sometimes on the basis of quite slender evidence, announce some modification in technic which they flatly state to be, or clearly infer, is the final answer to one or other problems of the operation. At a later time they make a further announcement which partly or completely disregards the first, without taking the trouble to explain that the previous technic proved unsatisfactory for one reason or another. This is most

unfortunate since it is unnecessary and creates confusion and doubt.

It is hoped that the really significant and scientific research which is now being carried on in several centers will yield some of the answers to the problems, and that the results will be announced to the waiting world only after confirmation and proper statistical study, in a manner which will restore the confidence of all in this quite wonderful advance in otology.

CONCLUSIONS

Despite serious problems still awaiting full solution, despite criticism and disbelief, in the face of the technical difficulties of the operation, which is surely one of the most intricate and delicate in the whole realm of surgery, and notwithstanding the very great disappointment to patient and surgeon when it fails for any reason, there can be no doubt but that fenestration for clinical otosclerosis is here to stay. Even with its uncertainties and present day imperfections, it can lead to the rehabilitation of persons seriously handicapped by deafness in the very middle of the best years of their lives. It can restore them to happy human beings, socially and economically. It does this, make no mistake, even if not as often as anyone could wish.

The future is certain to bring forth improvements in technic by which the operation will be perfected. This is not too much to expect in the light of the fact that the modern operation of fenestration is now only eleven years old.

While we all wait for this future to become the present, it is the humble opinion of the author, based on his own experience, that all otolaryngologists should put aside their doubts and skepticism regarding the fenestration operation. He suggests that they study the indications for the operation closely, be on the watch for and select suitable cases carefully, and offer them the operation at the hands of a fully trained and highly skilled surgeon. This should only be done after a most careful and honest explanation to the patient of the possibilities for both success and failure, leaving the choice completely in the hands of the

patient. He feels strongly that this constructive and optimistic though realistic course will even now be followed by success often enough to make it clearly the plan of choice in the rehabilitation of disabling deafness due to clinical otosclerosis.

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REMOVAL OF THE AURICULAR APPENDAGE AND ITS POSSIBLE THERAPEUTIC USE

A PRELIMINARY REPORT

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NEW ORLEANS

The treatment of auricular fibrillation is not altogether satisfactory. It is not possible in all cases to effect a conversion to normal rhythm by using quinidine and digitalis, and even if normal rhythm is resumed, emboli already formed may be dislodged by contraction of the auricle. Anticoagulants are useful when emboli complicate the arrhythmia, but it is not feasible to continue their use indefinitely and of course clots already present are a constant source of danger. It seems reasonable that removal of that portion of the auricle where the situation is most favorable for clotting during fibrillation may be useful in treating patients who do not respond to medical therapy. By removing the auricular appendage the channel for circulation of the blood is decreased in size, and the reservoir for thrombi is attenuated. The result should be a diminution in complications due to emboli and an increase in the aid which can be offered to the patient afflicted with auricular fibrillation.

A suitable technic for removing the auricular appendage is desirable and has been worked out in the laboratory during the past two years. Twenty dogs were used and both auricular appendages were removed in each. In 16 the operation was done in

two stages, and in 4 it was done in one stage. All animals survived removal of either the right or the left appendage. When the remaining appendage was removed as a second stage, all lived except one animal which died from an overdose of nembutal in the immediate postoperative period. Three of 4 dogs died after both appendages were removed in one stage. Autopsy revealed pneumonia of the left lower lobe in 1 dog and atelectasis in all 3.

Observation of the living animals for a period up to two years showed no detectable deleterious effect of the operation. They gained weight which was not due to edema, proved at autopsy, and one delivered a litter in the postoperative period.

The technic of auricular appendectomy was evolved with the objectives of safety and simplicity in mind. The animals were anesthetized with intravenous nembutal, and positive intratracheal pressure was supplied during operation. The chest was entered through the third interspace. Because of the rotation of the heart, the pericardium was opened anterior to the phrenic nerve on the right and posterior to the nerve on the left. The tip of the appendage was grasped with a hemostat, and the walls of the base of the appendage, including a portion of adjacent auricle, were sutured together with interrupted silk, mattress sutures. Adjacent sutures were then tied to each other. A linear closure resulted. Before removing the isolated appendage, a small opening in the distal portion proximal to the hemostat was made in order to check the presence of a competent suture line. The pericardium and chest wall were closed with interrupted sutures. The operation visualized in man would include opening the tip of the appendage carefully for removal of any clot present, the application of a hemostat, and the procedure described above.

At autopsy the auricular stump was well healed in all cases, and microscopic sections showed endothelium covering the scar. There were no signs of cardiac failure or embolic phenomena. The average weight of the right auricular appendage was 756 mg.,

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of the left was 704 mg. The average weight of the heart was 109.8 gm.

The electrocardiogram showed some minor changes in the P wave. The V leads were taken with the electrode at the level of the auricle. Removal of either right or left appendage or both resulted in decreased height of the P wave in leads I, V₃, V₄, and V₅. There was diminished negative deflection of the P wave in leads V₁ and V₂ after removal of both or either appendage.

Results of these experiments indicate that removing one auricular appendage is not likely to be attended by excessive mortality. This operation should lower the mortality from emboli arising in a fibrillating auricle. An additional possibility is the effect of such a procedure on the fibrillation itself. The circus movement which is present in fibrillation may be stopped by shortening the pathway, speeding conduction, or lengthening the refractory period. It is conceivable that shortening the pathway surgically, alone or in conjunction with drugs, might alter or even convert the arrhythmia. This was not found amenable to experimental testing. There seems, however, sufficient justification otherwise for the procedure in man and the answer as to whether fibrillation itself will be altered can be determined in that manner. There is no desire to alter or detract from successful medical management of auricular fibrillation, but it is believed that in a selected group of cases the proposed operation may offer the patient some additional promise.

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LOUISIANA STUDY OF CHILD HEALTH SERVICES¹⁶

CHAPTER IV PRIVATE PRACTICE PHYSICIANS

As of May 1946, there were 1487 physicians engaged in private practice in Lou-

isiana; there were 522 children for every physician. The national average was 310 children per physician. Among the forty-eight states, this figure varied from 143 to 764; Louisiana ranked thirty-seventh among all states in this respect. In the southeastern region of the country, with an average of 588 children per physician, Louisiana ranked high. Figure 6 indicates Louisiana's position relative to other states and regions. Because this was a study of child health services, number of children, rather than total population per physician, has been used to indicate relative accessibility of physicians to children. There were 42 women physicians in Louisiana and 11 of them were pediatricians. All but 58 of 956 general practitioners and all but 1 of 57 pediatricians were white. Forty-six per cent of the state's doctors were under 45 years of age, 38 per cent were between 45 and 65 years of age, and the remaining 16 per cent were older.

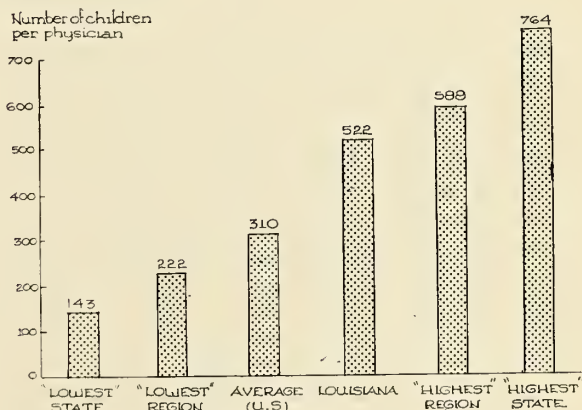


Figure 6. Children per physician; Louisiana compared with other states and regions of the United States.

It is realized, but must be emphasized again, that the number of *all* doctors—general practitioners, medical specialists, and dentists—in Louisiana is greater now (October, 1948) than it was when this study was made.¹⁷ There is no doubt that improvements in distribution have taken place as well.

Using the same type of classification for

¹⁶This is the second of a series of three reports on Health Services for Children in Louisiana, presented by the Louisiana State Pediatric Society and the American Academy of Pediatrics; the first appeared in the October issue of this journal.

¹⁷Louisiana supplied far more than its quota of doctors for the armed forces and in May of 1946, many physicians had not yet returned to practice.

parish or county types as was employed in the national study, and also in the first three chapters of this report, again it appears from the data in table V that children who live outside of our metropolitan parishes had relatively little available medical care.

TABLE V

NUMBER OF PHYSICIANS AND NUMBER OF CHILDREN PER PHYSICIAN, BY PARISH TYPE*

Parish Type	Number of Physicians	Number of Children per Physician
Lesser metropolitan	832	255
Adjacent	87	1131
Isolated semirural	471	787
Isolated rural	97	980
Entire state	1487 (total)	522 (average)

*As of May, 1946.

PEDIATRICIANS

Fifty-seven physicians in Louisiana reported that they limited their practice to children—for each of these there were 13,612 children. Among other states,¹⁸ this figure varied from 4,182 to 73,005, and the average for the nation was 10,299. Of the 57 pediatricians in Louisiana, 16 (35 per cent) had been certified by the American Board of Pediatrics; over the entire country, 51.4 per cent of these physicians were so certified. All of the pediatricians in Louisiana were located in centers having populations of 10,000 or more; 48 of them were in the three metropolitan areas and the other 9 were practicing in isolated semirural parishes.

OTHER SPECIALISTS

There were 474 specialists other than pediatricians; their distribution by specialty and certification appears in Table VI.

TABLE VI

NUMBER OF SPECIALISTS, AND NUMBER CERTIFIED, BY SPECIALTY*

Specialty	Total Number	Number Certified by Specialty Board
Internal Medicine	111	38
Allergy	6	1
Psychiatry and Neurology	17	7
Surgery, except Orthopedic	123	38
Orthopedic Surgery	16	8
Obstetrics and Gynecology	54	16
Ophthalmology and Otolaryngology	119	50
Radiology, Anesthesiology	28	18

*As of May, 1946.

TRAINING OF PHYSICIANS

Five hundred and two of the 956 general practitioners gave information as to their hospital training; 13.8 per cent reported that they had received none at all after graduation from medical school, and an additional 2.5 per cent stated that they had had less than a year of such training. About 41 per cent of the general practitioners reporting had received between one and two years of hospital training, and 43 per cent of them had had two or more years. One can conclude, therefore, that at least one out of six physicians in Louisiana had received little or no hospital training; this same deficiency was found for about one out of five physicians over the United States generally.

More specifically for the purposes of this report, it was interesting to note that two out of every five practitioners in Louisiana had received none, or less than a month of hospital training in pediatrics. Similar deficiencies were noted for about half of the general practitioners in the entire nation.

PHYSICIANS' SERVICES

Data compiled from one-day reports of practicing physicians appear in Table VII, and permit a number of comparisons as to the total volume of care extended to children in the various parish groups in Louisiana with that found to be average for the United States as a whole, as well as for the highest and lowest ranking states in this regard.

TABLE VII

PRIVATE MEDICAL SERVICES FOR CHILDREN ON AN AVERAGE DAY; COMPARISONS BY REGIONS

REGION	PHYSICIANS VISITS PER DAY, PER 1000 CHILDREN (OFFICE, HOME, AND HOSPITAL)		
	Total	Sick	Well
United States	13.5	9.6	3.9
Louisiana	10.2	8.0	2.2
Metropolitan parishes	15.1	11.3	3.8
Adjacent parishes	6.9	6.0	0.9
Isolated semirural parishes	9.1	7.1	2.0
Isolated rural parishes	6.7	5.9	0.8
Highest ranking state	21.8	14.9	6.9
Lowest ranking state	7.8	6.3	1.5

¹⁸This and subsequent references to data for other states are taken from the National Report (see previous references).

Again, it appears obvious that children residing in rural parishes receive considerably less medical care in sickness or in health than do those in metropolitan areas. These differences seem to be more reasonably explained by inequitable distribution of physicians than by significantly better health—and consequent less need for medical care—among children living in rural parishes. Apparently, children in isolated rural parishes received less than a fourth as much medical attention when they were well, and less than half as much when they were sick, as did their city cousins.

Seventy per cent of the medical care extended to children in Louisiana was furnished by general practitioners; in the metropolitan parishes, this proportion decreased because of the relatively greater contribution from pediatricians and other specialists. Data of this sort are considered by parish types in the accompanying tabulation.

TABLE VIII

PROPORTION OF MEDICAL CARE RENDERED TO CHILDREN BY GENERAL PRACTITIONERS AND SPECIALISTS, BY PARISH TYPE IN LOUISIANA

	General Practitioners	Pediatricians	Other Specialists
Whole State	70.2%	14.7%	15.1%
Metropolitan	41.1	30.0	28.9
Adjacent	99.1	.....	0.9
Isolated semirural	86.6	5.8	7.6
Isolated rural	100.0	.....	.....

Over the country generally, 75 per cent of children were cared for by general practitioners, 11 per cent by pediatricians, and 14 per cent by other specialists.

NUMBER OF VISITS PER DAY

General practitioners reported seeing an average of 6 children and 14 adults as private patients daily; nationally, the average daily case load was found to be 16 patients per physician. As noted in the table which follows, nearly half of the general practitioners in Louisiana reported that they saw 20 or more patients daily, and 6 per cent of them saw 50 or more patients each day.

TABLE IX
CASE LOAD OF GENERAL PRACTITIONERS IN LOUISIANA ON AN AVERAGE DAY*

No. of visits in one day	Persons of all ages	Children under age 15
None	18	25
1-9	16	51
10-19	20	19
20-29	20	5
30-39	11	
40-49	9	
50 and over	6	
Total	100%	100%

*See text, under "place of visits", below.

The case load for pediatricians, as determined from records kept for twenty-eight consecutive days for each one, was an average of 21 children daily; the average for pediatricians over the entire United States was 16: pediatricians in Louisiana thus had a case load about one-third heavier than that of their colleagues in most of the other states.

PLACE OF VISITS

Every effort was made to distribute all of the questionnaires from which data as to case loads were derived in such a manner that it would be possible to obtain a fairly representative cross-section, including Sundays, holidays, and days off, in compiling the averages. This explains, of course, why some doctors—whose questionnaire happened to call for work done on a Sunday or during a vacation—reported that they saw *no* patients. From these same questionnaires, information was secured relative to the proportion of visits made to offices, homes, or hospitals; these data appear in Table X.

TABLE X
PLACE OF VISITS TO CHILD PATIENTS:
PERCENTAGE BY LOCATION

	PER CENT OF VISITS MADE BY		
	General Practitioners	Pediatricians	Other Specialists
Office	69	73	74
Home	17	13	5
Hospital	14	14	21
Total	100	100	100

SUMMARY

1. Louisiana had 32 per cent more children per physician than the average for the United States generally. Only 11 states had

a higher ratio of children to physicians, but Louisiana ranked slightly higher than the average for 12 southeastern states in this respect.

2. Outside of the metropolitan and adjacent areas of Louisiana, there were only 9 pediatricians, working among 60 per cent of the state's children who resided in 46 of its 64 parishes.

3. Specialized pediatric care was not easily accessible to children in many parishes, particularly those in the central part of the state.

4. Many physicians in Louisiana had had little or no formal hospital training of any sort after graduation from medical school, and about 2 out of 5 of them received none, or less than a month of hospital training in pediatrics.

5. Physicians' services received by children in our isolated rural parishes amounted to less than half of such services received by children in metropolitan parishes.

6. Seventy per cent of the medical care extended to children in Louisiana was furnished by general practitioners.

7. The case load for both general practitioners and pediatricians was about one-third higher in Louisiana than the average for the nation.

DENTISTS
NUMBER, TYPE AND TRAINING

As of June 1946, there were 681 dentists in private practice in Louisiana; 70 per cent of them answered questionnaires from which the data of this section were derived. About 30 per cent of these reported their ages to be less than 45 years, and 7 per cent of them were over age 65. Sixty per cent of the dentists were located in cities with 10,000 or more population, and slightly more than 6 per cent of them practiced in isolated rural parishes. There were 5 or more dentists in 31 parishes, and none in 4 parishes; 9 parishes had one dentist each and the others had from 2 to 5. The number of children per dentist in each of the parish groups appears in Table XI.

TABLE XI
NUMBER OF CHILDREN PER DENTIST,
BY PARISH TYPES

Parish Type	Children per Dentist
Metropolitan	604
Adjacent	2342
Isolated semirural	1528
Isolated rural	2105

Thirty-four dentists reported that they limited their practice to one specialty—2 to pedodontia, 14 orthodontia, 3 to periodontia, 9 to prosthodontia, and 6 to oral surgery; all but 4 of these specialists were in the metropolitan areas. Three of the orthodontists and 2 of the periodontists were certified by American Specialty Boards. Two hundred and nine of 221 dental general practitioners reporting on the item stated that they had received no post-graduate training in pedodontia, and only 4 of this number reported that they had received a month or more of such training. Six dentists reported that they were assisted by dental hygienists.

For the entire state, there was 1 dentist for 1,139 children; over the United States generally, there was 1 dentist for 548 children. Louisiana ranks in thirty-fifth place among the states, which vary in this regard from one to 273 up to one to 2155 children. Among the southeastern states, the average was 1428 children for every dentist.

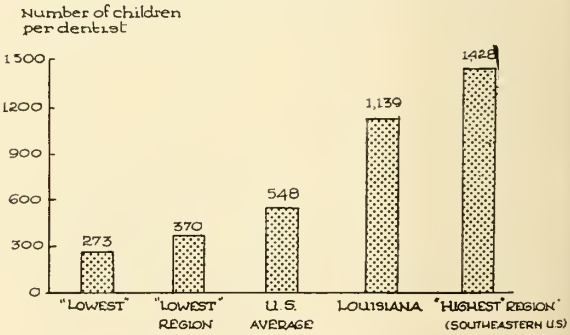


Figure 7. Children per dentist; Louisiana compared with other states and regions of the United States.

DENTISTS' SERVICES

Some comparative data referring to dental care on an average day appeared in Chapter II;¹⁹ Louisiana ranked thirty-fifth among the 48 states. Table XII permits

¹⁹ New Orleans M. & S. 101:176 (Oct.) 1948.

comparisons of the volume of dental care for children furnished in the various parish or county groups of Louisiana and the United States generally.

Parish Type	DENTAL VISITS OF CHILDREN ON AN AVERAGE DAY, BY PARISH OR COUNTY TYPE	
	VISITS PER 1000 CHILDREN	
	Louisiana	United States
Metropolitan	2.8	3.5
Adjacent	1.2	2.2
Isolated semirural	1.4	2.0
Isolated rural	1.0	1.1

About 24.8 per cent of the total number of dental services reported were extended to children under age 15; 7.1 per cent to those under age 6, and 17.7 per cent to those between 6 and 15 years of age. The data of Table XIII are based on returns from only 413 dentists; though incomplete, they indicate the type and distribution of dental services rendered to preschool and school age children. These dentists saw 8.2 patients on an average day. There were inadequate data on which to estimate differences in the amount of dental services furnished to white and negro children. Among other southern states, however, ratios for white children per white dentist were from 2.8 to 13 times larger than were those for non-white children per non-white dentist.

TABLE XIII
DENTAL SERVICES FOR CHILDREN
ON AN AVERAGE DAY
AGE OF CHILDREN

	Under 6 years	Six to 15 years
Extractions	80	109
Fillings	94	324
Other dentistry	28	68
Examinations only	18	154
Total number of children seen	220	655

Of 271 dentists reporting on the number of hours spent in various dental activities during one single month, it was noted that 7 of them contributed an average of three hours each per week to preschool and school dental services, and 19 of them spent an average of five hours each per week in other activities such as teaching, conducting out-patient clinics, or carrying out dental programs in various institutions.

SUMMARY

1. Louisiana ranked low among the states in number of dentists relative to its

population of children; there were over three times as many children per dentist in isolated rural parishes as there were in metropolitan areas.

2. Sixty per cent of the state's dentists were located in cities of more than 10,000 population.

3. Very few dentists had any formal postgraduate training in the care of children's teeth.

4. Dental services for children constituted about a quarter of the total volume of care rendered by the dentists of this state.

CHAPTER V COMMUNITY HEALTH SERVICES IN LOUISIANA

INTRODUCTION

Data have been collected bearing on some, but not all, of the kinds of health services for children usually provided by American communities. Discussion of these services will be largely quantitative, though it must be emphasized that quality of service is also of paramount importance. A child health conference, for example, cannot achieve real health supervision unless the workers—physicians, nurses, nutritionists and others—are well trained, interested, industrious, and really trying to do a good job.

Proper evaluation of qualitative as well as quantitative aspects of all its health services is a continuing responsibility of each local community.

Although, as has been shown, a relatively small proportion of total medical services for children is supplied by community health agencies, they lend themselves so readily to detailed analysis, and throw such light on the whole medical program, that they have been given extensive discussion.

COMPLETENESS OF HEALTH SUPERVISION

Medical well-child supervision merits first attention since it is the keystone of preventive medicine for children. One should know two facts to evaluate need for organized child health conferences: (1) What proportion of children should be registered in these conferences, and (2) how much service is necessary to give adequate care to this proportion. The answer to the

former question depends on a knowledge of the completeness of child health supervision, from all sources. A previous section of this report (Chap. III) has indicated that in Louisiana about 90 per cent of health supervision was given by private physicians and 10 per cent through organized child health conferences. From this ratio and the knowledge that 10,674 different children²⁰ were reported under care at Child Health Conferences one can assume that about 106,000 children, one third²¹ of the children under age 5, were under medical supervision from all sources.

An even more significant measure of completeness of health supervision may be made by estimating the proportion of infants under age 1 who received care. This is the group, above all, for whom medical supervision is most needed. Although, again, the data are not available directly, more than one-third of the babies born in the state that year may be presumed not to have had medical well-child supervision from any source.²² It is obviously of para-

mount importance, for further improvement in infant health and continued lowering of infant mortality, to extend health supervision to this group through expansion of services rendered both by practicing physicians and child health conferences.

Just what proportion should be provided by child health conferences depends on a variety of factors, including economic status and availability of physicians. It seems obvious that the 10 per cent provided in Louisiana was inadequate for the state as a whole but need will vary from a smaller percentage in relatively well-to-do areas to the great majority in poorer sections. With the goal of completeness ever in mind, plans must be worked out for each community on the basis of local conditions.

ESTIMATED PROPORTION OF CHILDREN UNDER HEALTH SUPERVISION IN LOUISIANA

UNDER 1 YEAR OF AGE

UNDER 5 YEARS OF AGE



■ = UNDER SUPERVISION

Fig. 8

COVERAGE BY CHILD HEALTH CONFERENCES

Variation in numbers of children under supervision within Louisiana and in the nation as a whole is presented in Table XIV.

this proportion holds for the entire group, 5,500 of the 10,674 children registered were under age 1. In order to relate this to the births which took place during the year it is necessary to apply a correction factor (Wegman M. E. and Bellows, M. T.: *Indices and Standards for Child Health Services*, American Journal of Public Health, 35:715, July, 1945.) which may be estimated as two-thirds, since the actual correction factor cannot be calculated from the data available. The number of infants coming under care for the first time in Child Health Conferences would therefore be 3,665. Using the 90-10 ratio referred to earlier, one may conclude that, in all, 37,000 infants came under medical well-child supervision during the year. This constitutes 64 per cent of the 57,838 births which took place in the year 1945.

²⁰This figure is actually high, since it is customary in clinic records to count infants and preschool children separately. Thus, when a child passes his first birthday during the year he is counted twice in this total.

²¹This proportion may also be estimated in another way. It has been noted earlier (Chap. III) that on a single day 3.2 visits per 1,000 children under age 5 were made for health supervision. If this rate continues daily throughout the year, and visits per child to physicians and conferences are at essentially the same rate, a total of 1160 visits per 1,000 children would be expected in a year.

Most pediatricians aim at monthly visits during the first year, four to six visits during the second year and visits two or three times a year thereafter. Clinics, in view of limited facilities, use a lower standard of nine visits in the first year and two a year thereafter. Since 1,000 children under 5 will include approximately 200 in each year of age, a very conservative estimate of visits needed would be 200×9 equals 1800; plus 800×2 equals 1600; or a total of 3400, almost three times as many visits as were actually made that year.

From these approximations, it is probably fair to say that two-thirds of the children in Louisiana under 5 years of age were not receiving medical well-child supervision at the time of this study.

²²The proportion of children registered in Child Health Conferences who were under age 1, was reported for 40 per cent of the State total. If

Metropolitan areas in the state had better than double the state average; on the other hand, isolated rural areas, containing 12.2 per cent of the children under 5, had only one third the state average.

The Louisiana average, 33 per 1,000 children under 5, was about half the national average; 33 states reported higher figures. In eight states, moreover, the average was well over 100, and in one it was 265, indicating that there were eight times as many children under health conference supervi-

TABLE XIV

CERTAIN CHARACTERISTICS OF CHILD HEALTH CONFERENCES, BY PARISH (OR COUNTY) GROUPS

	Children Registered	Visits	Sessions	Attendance per Session	Visits per Patient per Year
	per year, per 1000 population under 5				
U.S.A.—total	62.3	181.5	11.4	15.9	2.9
Lesser Metro- politan	79.7	220.7	14.1	15.7	2.8
Louisiana-total	33.0	109.5	7.8	14.1	3.3
Lesser Metro- politan	74.9	319.7	15.8	20.2	4.3
Adjacent	24.1	34.9	5.7	6.2	1.4
Isolated					
Semirural	15.4	23.3	4.4	5.3	1.5
Isolated Rural	10.5	22.2	3.6	6.1	2.1

sion, proportionally, as in Louisiana. The discrepancy was greater in rural areas; Louisiana figures for metropolitan and adjacent areas are almost up to the national average for this segment of the population.

NUMBER OF CONFERENCE SESSIONS

To provide health supervision through child health conferences 2509 sessions were held in the year of the Study—7.8 per 1,000 children under 5, 68 per cent of the national average (Table XIV). If these conferences gave no greater proportion of child health supervision than was reported, it can be estimated that four times as many clinic sessions would be needed to discharge the responsibility adequately.²³

²³If as many as 12 children can be seen effectively in a two hour session (an average of only ten minutes per child), at least 28 sessions per 1,000 children under 5 would be necessary. (3400 visits needed for 1,000 children; 10 per cent to be provided by child health conferences equals 340; divided by 12 patients per session equals 28.)

PROPORTION OF POPULATION UNDER 5 YEARS OF AGE
ATTENDING CHILD HEALTH CONFERENCES
BY POPULATION GROUPS

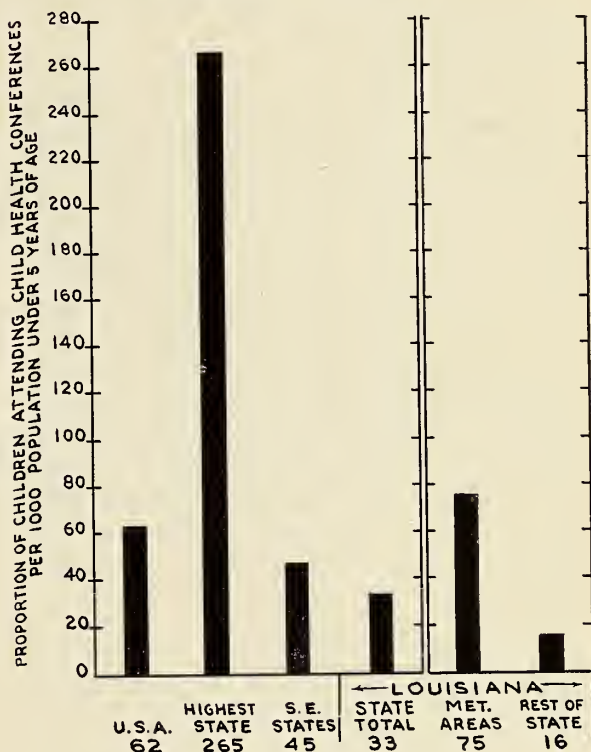


Fig. 9

Figures for the state as a whole are to some extent misleading because of variations by parish groups. In metropolitan areas, for instance, the number of sessions available was twice the state average and better than the national average for areas of this kind, despite the fact that Baton Rouge, capital of the state, had no child health conferences at all. In isolated rural parishes, by contrast, the sessions were about one-eighth of calculated need. In 31 of the 64 parishes, furthermore, there were no conference sessions at all; 34 per cent of the state's newborn children in 1944 lived in these parishes. For white births this figure was 32 per cent while for colored births it was 38 per cent, i. e., almost two-fifths of the colored child population had no public health conference readily available. In the nation as a whole, 31 per cent of the children under 5 lived in counties which had no child health conferences.

As expected, one finds the lowest amount of clinic service available in that very area

which has the lowest amount of service by private physicians. It is these same isolated rural areas which generally have the highest infant mortality rates.

ATTENDANCE PER CONFERENCE SESSION

In any conference session, considerations of economy and efficiency compete with the need for spending an adequate amount of time with each child. The average conference calls for two hours of the doctor's time. Desire for economy often results in aiming at an average of 20 patients, which allows him the grossly inadequate time of six minutes per child. Furthermore, variations in attendance, because of weather and other conditions, mean some sessions may have as many as 30 patients. This puts a frustrating burden on the physician, and also provides an almost insignificant amount of time for each child. Poor attendance at other sessions lowers the average but is no compensation.

In Louisiana, urban conferences showed overcrowding not conducive to the best work. The average number of patients at a session exceeded the national average for areas of this size by almost one-third. In rural areas the average attendance was much lower but one must not conclude that the average time spent with each child was necessarily greater. So many demands are made on the Health Officers in rural Louisiana that child health conferences are frequently part of the so-called "general conference". During the same two hour period, not only children are seen, but also patients with tuberculosis, venereal disease or other conditions. The "general" clinic is not a desirable arrangement and has many dangers, but inadequacies of staff often dictate such compromises with standards. As mentioned earlier, the very nature of rural geography and distribution of population makes it inevitable that average attendance will be lower than in cities.

AMOUNT OF SERVICE PER CHILD

As pointed out earlier, health supervision, to be meaningful, needs to take place at regular intervals, spaced properly to follow growth and development closely. It must

be reemphasized that number of visits per child is only part of the story. Quality of service and time spent at each visit are major determinants of success.

Infants should be seen more frequently than preschool children but the data give only combined averages. An average for our state of 3.3 visits per year, per child registered (Table XIV), is higher than the national average and, as a matter of fact, even approaches the nationwide average for "greater metropolitan areas". This is due chiefly to the superior record in the "lesser metropolitan areas" of the state, whose record exceeds the national average for such areas by over 50 per cent.

The average number of visits per patient is probably influenced chiefly by two factors: (1) quality of service as an inducement to patients to return; and (2) frequency with which clinics are held. In a city, clinics are held daily or several times a week in one location; whereas in an isolated rural area there may be too few patients to justify a clinic session more than once a month. If some untoward incident keeps a child away on a given day, a whole month or longer must elapse before he may attend another clinic session.

One can, to a very limited extent, evaluate completeness of service to children registered in child health conferences by comparing the total number of visits which should have been made with those actually recorded. Such an analysis indicates a statewide performance of over 80 per cent of that expected by minimum standards. More satisfying is the record of official agencies in the state's metropolitan areas where performance matched expectation almost exactly.²⁴

²⁴Using the minimum standards cited above (Footnote 21) the 3665 different infants estimated to have been under supervision (Footnote 22) should have made 9 visits each, and the 5200 preschool children 2 visits each, a total of 43,000, compared with 35,000 visits actually recorded. For the official agencies in metropolitan areas, moreover, expected performance, making the above assumptions, is 26,200 visits and actual performance is 26,548, indicating very creditable work, even though short of the optimum.

STAFF

Contrast between rural and urban areas in regard to staff in clinics is very striking. In metropolitan areas of the state the great majority of sessions, 82 per cent of the total, were conducted by pediatricians. In the rest of the state, no pediatricians at all were in charge. Responsibilities here were divided between general practitioners and health officers who "doubled" as clinic physicians, in the proportion of 54 to 46, similar to the national average.

Consultation services to clinics by nutritionists were reported as good but services by psychiatrists and psychologists were almost nonexistent. In metropolitan areas, however, such consultation services were reported as being available in more than 80 per cent of clinic sessions. "Available" probably means in the community rather than in the clinic itself.

PUBLIC HEALTH NURSING SERVICES

Directly related to child health conferences are public health nursing services. It is almost axiomatic that a child health conference is not likely to be effective without public health nursing follow-up, yet 24 per cent of conferences in the New Orleans area, reported as not under health department auspices, were without this service. At the time of the survey, Louisiana had a total of 195 full-time public health nurses, 1 per 12,000 population or 25 per 100,000 children (Table XV); 10 parishes (16 per cent) had no public health nursing service at all.²⁵ This deficiency in number of public health nurses is one of the most

TABLE XV
PUBLIC HEALTH NURSING SERVICES
BY PARISH (OR COUNTY) GROUPS

	Public Health Nurses		Home Nursing Visits	
	per 100,000 children		per 100,000 children	
	U.S.	La.	U.S.	La.
Total	40	25	210	75
Lesser Metropolitan	55	44	303	149
Adjacent	27	13	125	41
Isolated Semirural	24	19	94	51
Isolated Rural	15	20	48	40

²⁵In contrast to the increase in number of physicians in practice since the time of the Study, the actual number of public health nurses in the state has decreased more than 15 per cent.

important limiting factors in extension of child health services.

The National Organization for Public Health Nursing has set as a minimum standard 1 nurse per 5,000 population and strongly recommends 1 to 2500, or 125 nurses per 100,000 children. Louisiana would need five times as many nurses as are now employed, in order to reach this standard. The best state in regard to public health nursing service reported an average of 101.1, four times Louisiana's average, and 34 states reported figures higher than Louisiana's. Even our metropolitan parishes reported figures well under the national average for areas of this type, and other areas of the state had less than half the metropolitan average.

The educational preparation of public health nurses in Louisiana was not adequate. Of the 194 reporting on preparation, only 47 (24 per cent) had completed a full year of public health nursing training; the rest had none or less than one year. The duties of the public health nurse are different from those of the well trained hospital nurse and public health training makes up little of the undergraduate curriculum in schools of nursing. Since a considerable amount of teaching is an integral part of a public health nurse's daily work it is essential that she receive special training in this field.

Rates for home nursing visits to children appear to be related at least in part to distance, since this figure is higher in more densely populated states. Thirty seven states have figures higher than those in Louisiana, and the average in the highest state, 858, was more than ten times Louisiana's. Again the metropolitan areas stood out in comparison with the rest of the state.

Only one parish in the state, Orleans, had service which could be classed as complete with regard to all four essentials for public health nursing service to children (Child Health Conferences, home visits for health supervision, school nursing, bedside nursing). Three states indicated that 100 per cent of their counties offered such complete service but the national average was 18.6

per cent. Throughout the nation metropolitan areas were superior in this category.

If one disregards bedside nursing service, which is often considered separate from general public health nursing, 42 parishes, 66 per cent, had services complete in the other three essentials. The nationwide average was 41 per cent; 5 states reported that 100 per cent of their counties offered such service.

SCHOOL HEALTH SERVICES

Since surveys from various areas have shown that health services available to school children are usually sadly lacking both quantitatively and qualitatively, the mere presence of this service should not be accepted as adequate. Furthermore, 14 parishes, in which 13 per cent of the children in the state resided, had no organized school medical service in public elementary schools, and 9 parishes, with 5 per cent of the children, had no medical or nursing service at all. Metropolitan areas apparently had relatively complete coverage.

Louisiana did better than the United States average in percentage of children living in parishes with school medical service, the latter showing 22 per cent with no service. Statewide practice in Louisiana (except in Orleans parish) of centering medical service for school children in parish health departments, rather than setting up separate departments of health service in the school system, is probably responsible for this superiority.

Only 2 pediatricians actually worked in schools and both of these were in metropolitan areas. In the whole state, other than the 30 Health Officers (who covered 55 parishes), most of whom did some part-time work in the schools, there were only 7 physicians, including the 2 pediatricians mentioned above, giving services in the schools. Twenty-one nurses in New Orleans and 1 in another parish did school work exclusively. Elsewhere in the state, service was given under the more desirable generalized public health nursing program.

Analysis of school services available by race shows that colored children were somewhat worse off than white. Seventeen per

cent of the colored and 13 per cent of the white school children lived in parishes that had no school medical services. There were no differences in metropolitan and adjacent areas, although, as pointed out above, we have no information as to relative adequacy of the service in the various schools. In isolated rural areas 22 per cent of colored and 12 per cent of white children lived in parishes that had no school medical services.

DENTAL CARE

Deficiencies in dental care are among the greatest public health problems facing our country. Louisiana is no exception. It is extremely difficult to set proper standards for amount of dental clinic care necessary, but the inadequacy of the present situation speaks for itself. A total of 2,966 hours of dentist service was given by official agencies, and 1,408 by voluntary groups. For the population in the state under 15 years, this is an average of six hours per 1,000 children per year (less than one half a minute per child), compared to a national average of twenty-seven hours per 1,000 children. The highest state in this regard had a figure of 121 hours per 1,000 children or twenty times the service in Louisiana. Thirty-three states ranked higher than Louisiana in this category.

It is of interest to note that 32 per cent of the total dental clinic services was provided by voluntary agencies; in medical services the figure was 13 per cent. Distribution of dental clinic service was even more disproportionate than medical. Six parishes of the 64 in the state had dental clinics and in 2 of these voluntary groups were working.

SPECIAL SERVICES

One comment that can be made on the special services analyzed is that they were few and far between. Mental hygiene services were available only in New Orleans. Orthopedic clinics were better distributed, being held in eight centers with attendance by patients from all over the state. There were no centers at all reported for rheumatic fever, vision, or hearing,

but there were two reported for speech training.

No mental hygiene service was given by official agencies and only one voluntary agency was active, in the New Orleans area. Here, too, on a quantitative basis, the number of children cared for is very small, totalling only 217 for the whole community, obviously inadequate. This is borne out by a comparison with a national average of 2.2 mental hygiene clinic patients per 1,000 children, with Louisiana near the bottom of the list with a figure of 0.3. Sixteen states had lower figures, including 12 states with no such service at all.

The total number of physically handicapped children cared for was 2,320, an average of 3.0 per 1,000 children. This compares with a national figure of 4.6, but again there is a wide discrepancy. Six states reported an average of more than 10 and one had 14.4. Since it is not likely that Louisiana has fewer physically handicapped children than other areas it appears that a great proportion of these children are not receiving clinic services.

SUMMARY

1. It is estimated that of the children in Louisiana one-third of those under one year of age, and two-thirds of those under five, were not under child health supervision from any source.

2. Three per cent of the state's children under five received supervision through child health conferences—half the national average and three-quarters the average for the southeastern states. Five times as many

children, proportionally, were under health conference supervision in metropolitan areas as in the rest of the state.

3. Continuity of supervision by health conferences, as measured by number of visits per patient, was well up to standard in metropolitan areas but much lower in the rest of the state.

4. Conference sessions in metropolitan areas were overcrowded.

5. In 31 of the 64 parishes of the state, containing 34 per cent of the state's new-born children, no child health conferences were available.

6. Conferences in metropolitan areas were held chiefly by pediatricians, in the rest of the state by general practitioners and health officers.

7. Public Health nursing services in the state amounted to 20 per cent of estimated need and about 60 per cent of the national average. Services in metropolitan areas, while better than the statewide average, were 20 per cent lower than the national average.

8. School health services were widely distributed, but 17 per cent of the colored children and 13 per cent of the white children in the state lived in parishes without any school medical service.

9. Dental clinic service was meager and available in only six parishes of the state.

10. Special clinics, such as those for mental hygiene, rheumatic fever, speech and hearing defects, were either non-existent or not generally available.

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VIRUS HEPATITIS
INFECTIOUS HEPATITIS

Infectious hepatitis is a term to include catarrhal jaundice, epidemic jaundice, and acute yellow atrophy of the liver. Circumstances were propitious for the study of various jaundiced states in the recent war. Many problems were solved. The above-mentioned conditions were shown to represent phases of a single disease entity. A new concept of the condition being due to a virus was evolved.

Haven (Medicine, September 1948) has presented a comprehensive and clarifying review of this subject. He discusses the

forms of viral hepatitis: (1) Infectious hepatitis covering the concepts indicated above. (2) Homologous serum hepatitis, covering late postarsphenamine jaundice, syringe jaundice, transfusion jaundice, yellow fever vaccine jaundice. Whether or not the strains of virus producing the two types are different is not known. It is clear that the manifestations are sufficiently different to be separately considered.

It is seen that infectious hepatitis was recognized in the ancient world and has recurred sporadically and epidemically in civilian and military history since. It was a problem in Napoleon's troops in Egypt, in the Civil War, and in World War II in the troops stationed in the Mediterranean littoral. It occurs sporadically, endemically throughout the world. It is felt that the disease is more prevalent where sanitary conditions are poor. There is a tendency for an increased incidence in the autumn and early winter months.

Infectious hepatitis is primarily a disease of childhood in civilian life, but may occur at any age. Those under 15 are most susceptible. Among troops in World War II, those up to 30 were very susceptible, and after age 33 the incidence declined sharply.

The method of transmission is not known. Epidemiologic and experimental evidence suggests that some form of person-to-person contact is frequently operative. Various outbreaks have been considered as food-borne, milk-borne, and water-borne. Spread by the respiratory route has not been proved. The disease may be transmitted by the injection of as little as 0.01 cc. of infectious serum; accordingly, insect vectors have been considered, but not proved, as a means of transmission.

There is no susceptible laboratory animal and no specific serologic test. Much of the available information on virus hepatitis was obtained from experiments on volunteers. Convalescents from experimentally induced infectious hepatitis were immune when reinoculated with the homologous strain. Similar convalescents from infection with a Pennsylvania strain were im-

mune to the virus from a stool of a soldier who contracted jaundice in Italy.

The most striking effect of hepatic virus in man is in the parenchymal cells of the liver. It is a generalized infection. There are also lymphadenopathy, splenomegaly, inflammatory changes in the intestinal tract, and evidence of anemia. Biopsies in various stages in nonfatal cases revealed a number of inflammatory and degenerative changes in liver cells. Recovery takes place usually in one to two months, but may be much longer. Nodular hyperplasia, postnecrotic cirrhosis, and portal cirrhosis have been recorded in patients who have had infectious hepatitis. The frequency of this transition to cirrhosis is not known. In the fatal forms of the acute disease, the progression may be fulminant within ten days, or subacute over three to eight weeks. It has been demonstrated that the etiologic agent is filterable, resistant to heating to 56° C. for thirty minutes, and transmissible to man by feeding or by parenteral inoculation of infectious material.

The clinical course of the disease is milder in children than in adults. The incubation period is probably twenty to forty days but may be as short as ten days. In the child, the condition appears abruptly with headache, chills, fever, abdominal pain, and vomiting; diarrhea may develop. The temperature ranges from 100 to 102° F., and after four to five days declines. At this time jaundice appears and persists ten to twelve days, followed usually by recovery.

In the adult there is usually a pre-icteric phase, as in the child, with the symptoms somewhat more intense. Anorexia is the most common and usually the earliest symptom. Jaundice may appear in the febrile period. The duration of jaundice is three to five weeks but may extend to four months. In the pre-icteric phase, the examiner may find some posterior cervical lymphadenopathy, moderate injection of conjunctivae, tenderness in the right upper quadrant, and enlargement of the liver. The liver frequently becomes tender. The mortality is less than 4 per 1000. Relapse may occur,

and in such a case jaundice may or may not appear. Chronic hepatitis may persist in a small group and has been reported as occurring in 5 and in 2.3 per cent.

Laboratory studies have revealed that the erythrocytes are usually normal, but after debilitating illness, anemia may develop. There is a lymphopenia and neutropenia, early followed by a return to normal. The atypical lymphocyte can not be differentiated from similar cells considered diagnostic of infectious mononucleosis. Sedimentation index is not increased early in the disease but is increased on the third day of malaria. Certain observers report 20 per cent false positive Wassermann and Kahn reactions, and others, 1.5 to 2.5 per cent. Liver function tests show significant alterations. The bromsulfalein test may become positive as early as the third day. Roentgenographic studies in volunteers have shown evidence of gastroduodenitis. Gastroscopic examinations similarly have revealed small aphthous ulcers and acute gastritis. Transient electrocardiographic changes have been observed.

The differential diagnosis before the appearance of jaundice must cover the acute enteric fevers, malaria, dengue, infectious mononucleosis, and appendicitis. During the icteric phase, biliary sepsis, Weil's disease, yellow fever, malaria, and carcinoma of the pancreas, or other forms of biliary obstruction may be confused in the differential diagnosis. More remotely to be considered are the septicemias, amebic hepatitis, hemolytic jaundice, and jaundice resulting from chemical poisoning.

The treatment of this condition is symptomatic. Human gamma globulin has no value when given after the onset of the disease. Bed rest and adequate diet are the important provisions which must be obtained. During phases of anorexia and vomiting the usual supportive measures should be instituted. In convalescence, 3000 to 4000 calories are desirable.

The prognosis is usually good but less favorable in those patients who have a history of previous disease of the liver. Specific measures for community prevention

and control are not known. Adequate sanitation is of value here as elsewhere. Individuals may be protected if normal human gamma globulin is given six days before the onset of the disease. For the average adult, 10 cc. is sufficient.

HOMOLOGOUS SERUM HEPATITIS

Homologous serum hepatitis, as indicated in the preceding discussion, is a virus hepatitis, and the relation to infectious hepatitis is not clear. There were 51,337 cases in the U. S. Army epidemic of 1942, following the administration of icterogenic yellow fever vaccine. Numerous outbreaks have followed the use of other vaccines. The virus passes Berkefeld and Seitz filters and is resistant to temperatures of 56 to 60° C. for thirty minutes. It is parenterally transmissible to volunteers in serial passage and evokes homologous immunity. The incubation period varies from four to twenty-five weeks, and averages forty to one hundred and sixty days. The evidence is that parenteral transmission is the most important route. There is no evidence of cross immunity between homologous serum hepatitis and infectious hepatitis. The period of infectivity of patients with this disease is not known.

It is seen from these considerations that the existence of virus hepatitis presents a vastly different concept of jaundice due to a disease-producing organism and its pathology in the liver.

DIABETES WEEK
December 6-12, 1948

If every person would visit his physician for a routine physical examination each year, many diseases would be detected in the early phase, and treatment started at such a stage would bring results more satisfactory to patient and physician. However, because of the unwillingness of the public to utilize this method to its proper extent, many individuals continue to have undetected diseases. Consequently, special societies have resorted to the logical device of focussing the attention of the community on particular diseases, or groups of diseases, such as tuberculosis, cancer, heart disease, diabetes, and recently, multiple sclerosis.

To this end, the American Diabetes Association has proclaimed December 6-12, 1948, as "Diabetes Week."

In a recent survey of a Massachusetts city it was found that for every patient with diabetes, known and under treatment, there was another in whom the condition was unrecognized. To find who are the other 50 per cent of the community diabetics, the Association will sponsor the distribution of the necessary information, and will attempt to stimulate the public to have the needed examination.

Dr. A. A. Herold of Shreveport is organizing the program in Louisiana. This movement will require strong support from the physicians and will promote the best interests of the patient. Dr. Herold will need and appreciate the help of organized medicine.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

1949 ANNUAL MEETING

Plans are now underway for development of the scientific program and other features of the 1949 Annual Meeting of the State Society which will be held at the Roosevelt

Hotel in New Orleans on May 5-7. The Executive Committee has decided to hold the meeting next year on Thursday, Friday and Saturday instead of during the first part of the week and it is felt that there will be

many advantages to such an arrangement. The first meeting of the House of Delegates will be on Thursday, May 5 and the scientific program will follow, beginning on the night of May 5 and continuing through Saturday, May 7. There was recently held a meeting of the various scientific sectional chairmen at which time an outline of the proposed program was made. This includes an open meeting on Thursday night possibly with scientific papers presented by guest speakers and symposia on Friday morning and afternoon. Specific subjects have not been selected for these symposia, however it is probable that one of these will deal with traumatic surgery. On Saturday morning and afternoon there will be held meetings of the various specialty groups; some of the smaller groups meeting together, as suggested by the chairmen of these sections. Luncheons will be held by some of these specialties on Saturday in addition to the regularly scheduled luncheons for the House of Delegates and general membership of the State Society which tentatively are planned for Thursday and Friday respectively. Any member desiring information concerning a specific scientific section should contact the chairman of the section in which he is interested. Following is information concerning the doctors who have been appointed to serve in this capacity.

Dr. Emma S. Moss, New Orleans—Bacteriology and Pathology.

Dr. Kenneth Jones, Shreveport—Ear, Nose and Throat.

Dr. P. L. Perot, Monroe—Eye.

Dr. Murrel Kaplan, New Orleans—Gastro-enterology.

Dr. C. Gordon Johnson, New Orleans—Gynecology.

Dr. Edgar Hull, New Orleans—Medicine.

Dr. D. L. Kerlin, Shreveport—Neuropsychiatry.

Dr. C. Raymond Mays, Shreveport—Obstetrics.

Dr. C. R. Reed, Shreveport—Orthopedics.

Dr. W. C. Rivenbark, New Orleans—Pediatrics.

Dr. W. L. Treuting, New Orleans—Public Health.

Dr. G. M. Riley, Shreveport—Radiology.

Dr. J. E. Heard, Shreveport—Surgery.

Dr. C. O. Frederick, Lake Charles—Urology.

Dr. Robert F. Sharp, of New Orleans, has been appointed by the President of the Orleans Parish Medical Society to serve as General Chairman of the Committee on Arrangements and has already been active in initiating plans for the meeting. The chairmen of sub-committees have not yet been appointed. When data are received in this regard it will be carried in the Journal so that members may contact the proper persons when desiring information concerning various phases of the meeting.

Floor plans for technical exhibit space have not yet been completed, however companies which have previously exhibited at meetings of the State Society have been contacted and from all indications we can expect a full participation by these companies which add considerable interest as well as financial assistance to these meetings.

It is hoped that many members of the organization are making plans to attend this, the sixty-ninth meeting of the Louisiana State Medical Society.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

SECOND DISTRICT MEDICAL SOCIETY

The regular meeting of the Second District Medical Society was held Thursday night, October 21 at the Wigwam Village, 4800 Airline Highway, Dr. Joel Gray, president, presiding. After a short business session Dr. Joseph Reddoch of New Orleans presented a most interesting paper on "Face Presentation."

FOURTH DISTRICT MEDICAL SOCIETY

Following supper in the hospital dining room, the Fourth District Medical Society meeting was held in the Assembly Room of the Shreveport Charity Hospital, Tuesday evening, October 5.

Dr. Ashton Graybiel, Captain in the United States Navy and head of the Research Department, Pensacola, Florida, was the essayist. In addition to pointing out some of the experimental work in progress in the Research Department, he discussed neurorespiratory asthenia and his observations on this interesting condition.

The following officers were elected for the year:

Dr. W. C. Gray, Springhill, President

Dr. R. B. Van Horn, Mansfield, Vice-President

Dr. Joe E. Holoubek, Shreveport, Secretary-Treasurer

Dr. L. S. Huckabay, Coushatta, Delegate to the State Society

Dr. J. C. Sanders, Shreveport, Alternate Delegate.

POSTGRADUATE COURSE ON
NEOPLASIA

A postgraduate course on neoplasia is to be given by Tulane University, division of Graduate Medicine, November 15-17, 1948. The schedule of papers extends over the three day period. All meetings will be held in the Hutchinson Memorial auditorium except those on the last afternoon, which will be in the Miles Amphitheatre at Charity Hospital.

Two guest speakers will discuss special phases of the cancer problem. Dr. Vernon David of Chi-

cago will give a paper on "Etiological Factors in Carcinoma of the Large Bowel." Dr. John McDonald of the Mayo Clinic will discuss "The Smear Technique as an Aid in the Diagnosis of Malignancy." These two presentations will constitute the first Annual Lectureship of the Louisiana Cancer Society. Thirty-three other papers in the field of malignant disease will occupy the remainder of the time allotted. Nearly every phase of malignant disease as it concerns the clinician will be covered. The subject matter has been selected in such a way as to present the prospect of a thorough discussion of established principles, recent contributions, and controversial subjects of practical importance.

L.S.U. MEDICAL ALUMNI ASSOCIATION
NEW ORLEANS DISTRICT

The New Orleans District of the L.S.U. Medical Alumni Association entertained its membership and their guests at the first of their annual dances on September 24 at the Jung Hotel. Over 400 persons attended; many of the graduates who are at present practicing in various South Louisiana communities were among them.

The guests of honor were the members of the present Senior Class of the School of Medicine, the Dean, and the Heads of the various Departments of the School. Also present were the Officers of the L.S.U. Metropolitan Alumni Association.

Before the dance several private cocktail parties were given by individual members which helped to make a complete evening of the affair.

It was announced that the next meeting of the New Orleans District would be held in the first part of January at a downtown center and that the State Medical Alumni Association had asked the New Orleans District to serve as host at a cocktail party to be given during the May meeting of the Louisiana State Medical Society. All graduates who attend the State Medical Society Meeting are invited to attend this party.

The committee for the dance included Dr. Jack R. Anderson, President of the New Orleans District, Dr. Elliot Roy, Vice-President, Dr. Philip Cenac, Secretary-Treasurer, Dr. Paul Getzoff, Dr. O. R. Depp, Dr. Marion LeDoux, Dr. Harry Brian, Dr. Lawrence Kavanagh, Dr. Robert Simmons, and Dr. Burchell Liles. Dr. Elliot Roy was in charge of arrangements.

SOUTHERN PSYCHIATRIC ASSOCIATION

The tenth annual meeting of the Southern Psychiatric Association will be held in Dallas at the Hotel Adolphus December 6-7. The President, Dr. Guy F. Witt, Dallas, Secretary-Treasurer, Dr. Newdigate M. Owensby, Atlanta, and the Chairman of the Committee on Arrangements, Dr. Arthur J. Schwenkenberg, Dallas, extend a cordial invitation to psychiatrists of Louisiana, including those connected with the Veterans Administration and the U. S. Army, to be present. Although the Association is designated as a psychiatric association it is made up of both psychiatrists and neurologists and several papers will be given in neurology and other allied fields.

WOMAN'S AUXILIARY

The Woman's Auxiliary is indeed grateful to the editors of the New Orleans Medical and Surgical Journal for the roster of its members with addresses printed in the October issue. All members should clip this entire section for future reference. It serves as a substitute for a Year Book which your Year Book Chairman, Mrs. S. L. Calhoun, has so capably compiled for you.

The October issue of "News and Views" has been mailed. If you have not received your copy please advise Mr. Frank Lais, Jr., 1430 Tulane Ave., New Orleans of the omission, with your name and address.

Year Books have been received by your chairman from the Woman's Auxiliary to the East Baton Rouge Parish Medical Society and to the Rapides Parish Medical Society, Alexandria. Programs for both auxiliaries have been planned for the year to include in some way all of the state projects for the year 1948-1949, namely: 1. Assisting Council on Medical Service; 2. Education—Membership, Laity; 3. Legislation; 4. Rural Medical Service; 5. Medical Cultural Items; 6. Hygeia; 7. Organization; 8. Health Days; 9. Red Cross; 10. Cancer; 11. Doctors' Day. Clippings from both auxiliaries reported interesting programs for the October meetings. The Alexandria Auxiliary based its program on articles from Hygeia and the Baton Rouge Auxiliary heard from the President of its Medical Society, Dr. John T. Lewis, who outlined a splendid Public Relations program.

A letter from the auxiliary to the Iberville Parish Medical Society, Plaquemine, stated plans to sponsor a boy and girl for Pelican State in 1949. The Orleans Parish Auxiliary maintains a history book with news and pictures of the auxiliary throughout the year instead of a year book. Cards are to be filed stating whether members have their annual check-up or not. A drive among members for both Tuberculosis and Community Chest through auxiliary chairmen is now taking place.

MRS. F. U. DARBY,
Press & Publicity Chairman

BOOK REVIEWS

Practice of Allergy: By Warren T. Vaughan, M. D. Revised by J. Harvey Black, M. D. 2d ed. St. Louis, C. V. Mosby Co., 1948. Pp. 1132. Price, \$15.00.

Warren T. Vaughan, son of Victor Vaughan of Ann Arbor, became interested in clinical allergy shortly after World War I. At that time the specialty of allergy was in its infancy. The pioneer work of Noon and Freeman of London in 1911, had just shown that people with grass pollen hay fever could be benefited by specific hyposensitization. Allergy was a frontier of medicine and men like Vaughan, Cooke, Black, and Coca were drawn to it. With the passage of the years Vaughan made many important contributions. His clinic in Richmond was well staffed and equipped.

In 1930 he published the first edition of "Allergy and Applied Immunology". This was followed by

a second edition in 1934. His later works "Strange Malady" and "Primer of Allergy" were intended primarily for the instruction of his patients. There was a second edition of the "Primer".

The first edition of "Practice of Allergy" appeared in 1939. This book at that time was the most comprehensive publication on allergy ever printed, and was a veritable storehouse of clinical observations. Many of the excellent illustrations were made by Vaughan himself with his Leica. The personal opinions of the author enriched the material. The reviewer read the book from cover to cover and has never regretted it. Many allergists spoke of it as their "Bible". The book had a wide demand, and later went out of print and became unobtainable.

Before his untimely death in 1944, Dr. Vaughan was collecting material for the second edition.

This task was later passed on to his friend and contemporary, Dr. J. Harvey Black of Dallas, who is himself one of the pioneers in allergy. He started in pathology, and later became interested in the budding specialty of allergy. He also has made many eminent contributions to the literature. He is highly regarded by all who know him, he is extremely modest, and many honors have rightfully been bestowed on him. He has always been sympathetic toward the problems of the younger men in allergy. He has held positions of honor in various national and sectional allergy societies.

The second edition of Vaughan's "Practice of Allergy" greatly resembles the first edition. The same illustrations are there. Much of the written material is unchanged. Black in his preface states that, "We have, in every instance, tried to retain the quality and the flavor of the book so that it might remain as it was written, 'Warren Vaughan's book.' It was the quality and the flavor which he gave it that made for its great popularity, and we hope it remains as distinctive as it was when he wrote it. We have added new material which has appeared, and removed any which, by the passing of years and accumulation of knowledge, has been made unacceptable. Where there is room for honest difference of opinion and his opinion differed from ours, we have retained his. Where advancement in our knowledge has made an opinion no longer tenable, we have not hesitated to change it as he would have changed it if he had lived to see this day."

In the book we have therefore the advantage of Vaughan's ideas and well organized material, which has been changed when needed to fit in with any altered viewpoints. New contributors appear in the second edition. O. C. Durham wrote the chapters on Field Surveys and Aerobiology. J. B. Howell rewrote the chapter on Fungus Infection With Associated Allergy. James Holman rewrote the chapter on Vital Capacity.

Your reviewer wonders why no mention was made of the study of Petersen and Vaughan on the connection of weather changes and fatal cases of asthma. This report appeared shortly before Vaughan's death, and it was not discussed in the second edition. Possibly Dr. Black has certain opinions on this topic which do not agree with those of the article.

Your reviewer feels that this new work will serve as a most valuable reference. The young man interested in clinical allergy will do well to read this book. He should absorb the opinions and viewpoints of the two authors. The dynamic personality of Warren Vaughan still lives.

HENRY OGDEN, M. D.

Motor Disorders in Nervous Diseases: By Ernst Herz, M. D. and Tracy J. Putnam, M. D. New York, King's Crown Press, 1946. Pp 184. Illus. Price, \$3.00.

Occasionally a medical publication appears which is so superior to other works of its kind that it is destined to be looked upon as authoritative for many years to come. Dr. Ernst Herz and Dr. Tracy Putnam of the Department of Neurology, College of Physicians and Surgeons of Columbia University, have succeeded admirably in presenting a concise yet complete discussion of abnormalities of the motor system.

All phases of the subject are discussed. Gait, involuntary movements, incoordination, reflexes and motor disorders of the cranial nerves are thoroughly covered. Clinical pictures are vividly presented by the use of strips of motion picture film throughout the text. Photographs, diagrams and anatomical drawings are used to illustrate the various problems of discussion.

One might wish that the authors had used more illustrations of neuropathological preparations to supplement the various case presentations. Beyond this no further criticism can be offered. To all who are interested in any phase of neurology this work is unhesitatingly recommended. To the reviewer it seems destined to become a classic.

JOHN W. BICK, JR., M. D.

Fatigue and Impairment in Man: By S. Howard Bartley and Eloise Chute. New York, McGraw-Hill Book Company, Inc., 1947. Pp. 429. Price, \$5.50.

As the authors state in their introduction, "Fatigue as an unpleasant experience has entered into the life of everyone." In spite of a considerable amount of work on the subject, however, very little definitive evidence is available as to its causation and characteristics. In this volume, the authors have brought together a considerable amount of physiological and psychological work and have attempted to evaluate its relationship to the problem.

It is pointed out that even a definition of fatigue is difficult. The common concept that fatigue is synonymous with impairment is shown to be unsound. The various definitions that have been used in physiological and psychological literature are examined in an attempt to arrive at an adequate definition. Considerable data is given on the various factors which have been shown to limit activity, such as anoxia, lack of sugar and salts, and temperature. Metabolism and nutrition are discussed and there is a splendid chapter on visual-fatigue studies. Hours and conditions of work in industry are discussed briefly. Of particular interest is a review of drug action in relation to fatigue or impairment. The common drugs such as caffeine, benzedrine, and alcohol, are considered and the

authors emphasize the scarcity of data as to the actual effects of these drugs on the individual insofar as fatigue is concerned. Sleep is discussed at length as are the various factors which influence it. The authors conclude that the primary function of sleep is to provide for various sorts of realignment that cannot occur while the organism is in the midst of high activities.

The latter part of the book is concerned with a review of psychological factors concerned in fatigue, such as training and conditioning, aging, "mental fatigue", personal factors in the situation, visual performance and fatigue, conflict and frustration, and chronic fatigue. In their conclusion, the authors point out that their monograph has served to indicate the necessity for considerably more work on the complex problem of fatigue. They reiterate their plea that future work on fatigue should be concerned with the experience of feeling tired rather than on specific limiting factors which so far have been important in showing what fatigue is not. The authors feel that the subjective phenomena generally have been given little consideration and yet are extremely important in the evaluation of the condition.

This is an unusually good monograph which will be of value to physiologist, psychologist and clinician. The latter will find it extremely valuable in providing him with a good review of the literature and, perhaps more important, in giving him a sound point of view on a subject in which he should be interested and well informed.

H. S. MAYERSON, PH. D.

A Biology of Disease: By Eli Moschowitz, M. D.
New York, Grune & Stratton, 1948. Pp. 221.
Price, \$4.50.

In the words of the author, the main purpose of these essays "is to stimulate a point of view and a methodology rather than to be strictly informative, and to emphasize the dynamic as opposed to the static approach in the study of disease." He considers that in the absence of a "knowledge of etiology, one of the best bases for the classification of chronic disease is a uniform and consistent pathogenesis." He makes an effort to show that diseases pursue a long course, and that it is frequent for investigators to pick out phases in the course of the disease and treat them as distinct syndromes rather than part of the whole. The contents of the book deal with twenty four medical topics. They are all ably presented and reveal the author to be authoritative in his chosen field. One cannot but feel, as he reviews the book, that here is a most timely subject, especially in an era of medicine when, in the words of Sir Thomas Lewis, "the continued separation of disease into types can

be pressed too far . . . and thus hinder progress in studying disease."

I. L. ROBBINS, M. D.

A Manual of Clinical Therapeutics: By Windsor C. Cutting, M. D. Philadelphia, W. B. Saunders, 1948. Pp. 712. Price, \$5.00.

This is a second edition quite satisfactorily brought up to date. The author presents "the workable facts of therapeutics as briefly and succinctly as possible." Since it is intended as a guide for students and practitioners it covers a broad variety of subjects. It should be quite helpful and merits the attention of one interested in this type of book.

I. L. ROBBINS, M. D.

Skeletal Tuberculosis: By Vicente Sanchis-Olmos, M. D., (translated from the Spanish by John G. Kuhns, M. D.). Baltimore, The William and Wilkins Company, 1948. Price, \$5.00.

This book presents in the English language many European doctrinal concepts and scientific judgments. It contrasts the methods of treatment and clinical concepts of two continents. The purpose of the publication is stated to be "with the intention of emphasizing that which is new or little known."

The book is divided into two parts, the first dealing with pathogenesis, pathology, etiology, and basic considerations in diagnosis, prognosis and treatment. The second part, entitled "Special Subjects", considers the various bone and joint structures individually.

In the first part, the author's vast working knowledge of the European and American medical literature is evident, although it is frequently presented in such abbreviated form that the reader gains the impression that the material was intended primarily for the expert who is already conversant with the European concepts. Much of the discussion is theoretical, but it at least gives the average American reader some insight into the European surgeons' line of reasoning.

The second part, dealing with the various anatomical areas, suffers from constant repetition of the pathology, roentgenographic appearance, symptomatology, differential diagnosis and prognosis. Much of this material could be condensed without detracting from the value of the book as a surgical reference. There is no mention of the use of streptomycin as an aid in the management.

The book is of little practical value to the practicing surgeon but should be of great value as a stimulating reference work for the real student of skeletal tuberculosis.

R. M. KIMBALL, M. D.

Foundations of Neuropsychiatry: By Stanley Cobb, M. D. 4th ed. Baltimore, William and Wilkins Co., 1948. Pp. 260. Price, \$2.50.

This is a fourth revised and enlarged edition of

the work formerly known as "A Preface to Nervous Disease." In it, psychiatry is conceived of as a pyramid, with the basic sciences as a foundation, and philosophy as the apex. As the author points out, the mental sciences are as yet only feebly supported by the fundamental sciences. Nevertheless, a great deal of material has been gathered by observation; but, because this book is designed for use as a preface to further studies in neurology and psychiatry, the author has limited his discussion to only those principles that are fairly well established, and in all cases has correlated the anatomic, physiologic, and pathologic data. There are thirteen chapters, on the autonomic nervous system, the cerebrospinal nervous system, motor integration and locomotion, the cerebral cortex, consciousness and the "mind-body" problem, cerebral circulation, cerebrospinal fluid, general neuropathology, the peripheral nerve and neuritis, special neuropathology, epilepsy, some psychological concepts important in medicine, and psychopathology. Although the small size of this volume causes this material to be served up in very concentrated form, it can, in general, be assimilated without difficulty by the student. The bibliography is well-chosen. The book should be of value to both the student and the practitioner, as it attempts, with some success, to give a broad and integrated view of the anatomy, physiology, and pathology of the brain. Because the problem of neuropsychiatry is such a great one, any volume, such as this, which will stimulate interest in the field, is a welcome one.

T. TREUTING, M. D.

Neuroanatomy: By Fred A. Mettler. 2nd ed. St. Louis, The C. V. Mosby Co., 1948. Pp. 536. Price, \$10.00.

This is an excellent text and reference work, especially for advanced students in neurology. It is superbly illustrated in both the gross and microscopic portions. The expanded sections on vascular supply are noteworthy additions. The text has also been brought up to date by the inclusion of the results of recent world-wide neurological investigations.

The general plan of presentation is the same as that used in the first edition. Part one is devoted primarily to the description of the gross anatomy

of the spinal cord and brain. Part two contains the minute description of microscopic sections of ascending levels of the neuraxis, cerebellum and cerebral hemispheres. Functional considerations are taken up as the nuclei and tracts are passed by in the various levels.

To those who believe this approach to the subject is desirable, this book should prove to be of great value. However, teachers of short introductory courses given to first year medical students will probably find the text somewhat unwieldy, especially if they prefer to emphasize functional systems with anatomical details cut to a minimum.

THEODORE SNOOK, PH. D.

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CLINICAL FEATURES OF A SUMMER DISEASE (THREE-DAY FEVER) APPARENTLY OF VIRUS ETIOLOGY*

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AND

VERRE SIMPSON, M. D.‡

SHREVEPORT, LOUISIANA

The efficacy of the antibiotics and sulfonamides in controlling bacterial infections has brought into clearer focus the numerous illnesses of childhood which are of nonbacterial—and presumably of viral causation. Whether or not there has been an actual increase in viral diseases, the physician who is in pediatric or general practice has an increasing awareness of the hitherto unrecognized viral etiology of many acute infections.

In 1946 we reported a series of cases of acute infectious hepatitis.¹ At that time we called attention to a number of bizarre clinical pictures which failed to fit the accustomed categories of acute pediatric disease. We postulated that some of these might represent milder childhood manifestations of virus infections which in the older individual produce a more distinctive and more easily defined clinical entity. It has been observed repeatedly during epidemics of known or presumed virus origin, such as hepatitis, poliomyelitis, pneumo-

nititis, or gastroenteritis, that subclinical or atypical cases are frequently encountered. It is possible that the younger child is peculiarly prone to exhibit acute systemic reactions without showing expected localizing manifestations.

Two other possibilities must be considered. First, there may be other viruses which, like herpes simplex, are comparatively innocuous to the adult but may produce acute illness in the child. Dodd and Euddingh² demonstrated that herpes simplex often causes severe, febrile, acute gingivostomatitis in the young child, whereas in the adult it rarely produces more than "cold sores" or "fever blisters".

During the past summer we saw a number of children of school age who became ill with high fever, headache, and vesicular studding over the soft palate or pharynx. Herpes etiology was suspected because of concomitant gingivostomatitis in two instances and a history of a parent with "fever blisters" in a third case. Material obtained from the pharynx of a child, acutely ill with typical vesicular pharyngitis, when transferred to the scarified cornea of a rabbit produced a characteristic keratoconjunctivitis, followed by encephalitis and death of the animal. This patient showed no evidence of gingivitis. It seems well demonstrated, therefore, that the virus of herpes simplex may produce acute gingivostomatitis in the very young child and herpetic pharyngitis in the older child, but is generally benign in the adult.

Second, there is a strong possibility that a number of acute infections of viral eti-

*Read before the Section on Pediatrics, Louisiana State Medical Society at the 68th Annual Meeting, Monroe, La., April 14, 1948.

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ology are unknown or undifferentiated. For example, it is generally conceded in recent years that certain types of pneumonitis and gastroenteritis are of viral etiology. Acute follicular tonsillitis, diarrhea of the newborn and sublingual glossitis of the newborn are other pediatric entities which are recent additions to the list of probable virus infections.

In our previous discussion of bizarre clinical pictures,¹ we called attention to a group of children, observed during the summer of 1946, who exhibited hyperpyrexia and headache without other demonstrable signs. The illness lasted three to five days and cleared as mysteriously as it developed. After this report at the Southern Medical Association, pediatricians from other southern states told us of having observed similar outbreaks during the same summer. In our locality, the 1946 outbreak was limited to the months of May and June.

PREVALENCE DURING 1947

During 1947, a more extensive outbreak of what appeared to be the same illness occurred in this area from the latter part of June until mid-September. During this period, the infection which we describe accounted for a considerable proportion of acute illnesses among the children of Shreveport and was highlighted because of the absence of other epidemics. We learned that a pandemic of a similar disease was present in a number of localities throughout the United States and was generally called "three-day fever". This seemed to differ from the "Virus X" of California, which at least in part is now known to be Influenza A.³ Laboratory studies conducted elsewhere, aimed at identifying a specific virus, gave negative results, so far as we can learn.

Clinical records reveal 40 children examined during the summer of 1947, whose symptoms seemed rather typical of this disease. Eight other patients are listed as possible instances, although subject to some doubt because of certain unusual features. The Caddo-Shreveport Health Unit made epidemiological studies of 30 of our "typi-

cal" and 8 "possible" cases, in addition to 4 "typical" and 7 "possible" which were seen by other physicians.* In addition, we had histories of 22 children and 3 adults, not seen by us, who were in contact with our cases and had a similar illness. Many suspected cases were treated by telephone. Observations by other physicians strengthened our belief that an epidemic existed, not only in Shreveport, but also in surrounding communities. Five children in our series were brought in from towns in the surrounding area.

EPIDEMIOLOGY

This epidemiological study is based upon clinical records of patients studied, in addition to information obtained from their parents during home visits made by the Public Health Nursing personnel of the Caddo-Shreveport Health Unit. The figures will be presented as they pertain to the two groups under consideration; first, 34 children in which the clinical features were those of "Three-Day Fever", and second, 15 additional cases in which this diagnosis was deemed a possibility.

Vector: Water and milk supply, food and insects were evaluated as possible vectors of the disease. The source of water was determined in every case and found to be uniformly city water, except in the three instances in which the patients had made recent trips out of town. However, for many years there has been no sudden epidemic in which the municipal water supply was incriminated or reasonably suspected. Pasteurized or evaporated milk were the only types consumed by any of the patients. Definite conclusions regarding food were impossible; however, none of the histories cast suspicion on the quality or source of foods ingested. As for insect vectors, in 18 of the 34 cases a history was given of bites or contact with mosquitoes and/or red bugs; 2 additional cases were in contact with but not bitten by ticks. Of the 15 possible cases, 5 gave a history of mos-

*We appreciate the cooperation of Doctors W. B. Worley and T. E. Strain, who submitted names of patients to the Board of Health.

quito contact. Because of the prevalence of these insect bites at this season of the year, particularly among the age group involved, these findings were not regarded as significant.

Out of Town Contacts: Only 10 of 34 patients had been out of the city during the summer, and of these 10 only 3 within a week of the onset of their illness. Of the 15 possible cases, however, 10 had been out of town, and 4 of these within a week of onset.

Contagion: Distribution of cases among families serves to demonstrate to some extent the degree of contagiousness of the infection. Out of 34 cases, 20 occurred among family groups, with one adult member showing similar manifestations. In 17 instances previous contact with a child, presumably suffering from the same illness, was established. In 7 instances the contact was found in the patient's own family, while in 10 cases the contact was a playmate. There are histories of the disease having spread from 10 children of our series to an additional 12 individuals, 8 of whom were in the family group and 4 outside of the family. The remaining 24 of the series did not spread the illness to other individuals, so far as could be determined.

Seven of the 15 possible cases occurred among siblings, again with 1 adult member presenting similar symptomology. There were also 7 instances of antecedent contact with children who had similar illnesses. Further, there were 10 cases occurring as a result of contact with 8 of these possible cases.

In addition to established contacts, 11 of the 34 patients in the first series and 8 of the 15 possible cases gave a history of swimming within one week before onset of their illness.

Incubation Period: Among the 17 instances in which a history of contact was established, the suggested incubation period varied from 2 to 7 days, with the majority approximating the average of 4.8 days. In the group of possible cases the indicated incubation period was found to range from 4 to 14 days, with an average of 6.6 days.

Seasonal Incidence: The distribution of cases by month was as follows: June—1; July—6; August—6; September—21; In the possible cases: June—1; July—2; August—2; September—10. It is of interest to note that during these months very few other contagious diseases were reported among children. The incidence of poliomyelitis, for example, was unusually low for the entire year of 1947. Three cases of this disease were reported from the city during the month of June, three during July and none during August or September.

Conclusions: It is apparent from a study of these records that no final conclusions can be drawn regarding the mode of infection in "Three-Day Fever". The evidence suggests that it is not spread by water or milk supply, food or insect vectors, but rather by direct contact, person to person. There is no definite indication as to portal of entry or whether swimming plays any significant role in its spread. The incubation period is believed to be under one week, most often four to five days. The disease is mildly contagious and affects children more often than adults.

CLINICAL FEATURES

Half of the 48 children were between six and twelve years of age, 20 were between one and five years, and only 4 were less than one year old. Extremes varied from five months to twelve years. As noted above, only 3 adults showed evidence of having acquired the infection.

The *onset* was typically abrupt, without prodromal symptoms. Sudden high fever, headache and malaise were characteristic early symptoms. A few children had low grade fever on the first day, rising higher on the second day, but this was rather unusual. Only three children in the series had nausea or vomiting on the first day of illness and only one complained of abdominal discomfort.

The *temperature*, characteristically, was elevated throughout the illness (Fig. 1), ranging between 101 and 104° F. A few children had one febrile day, followed by one to three days of normal temperature,

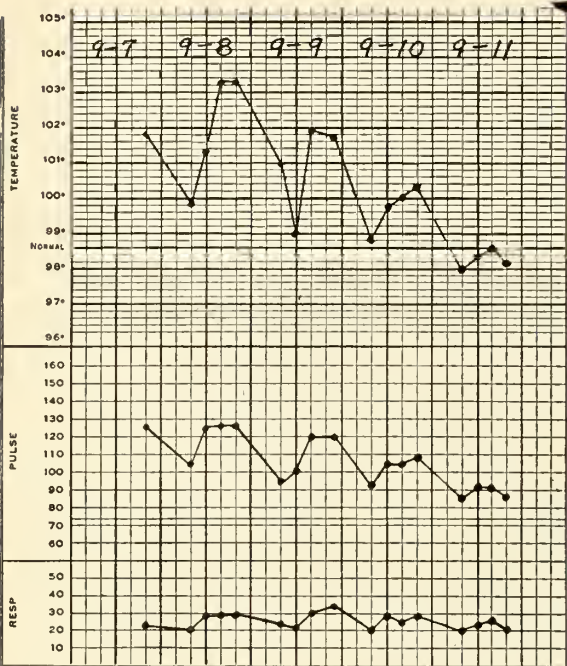


Fig. 1. Graphic chart of temperature, pulse and respiratory rates, B. M., age 6 yrs.

then a secondary rise for two to four days. The highest recorded temperatures in our series varied from 101 to 105° F., with most of the children (Table 1) having peak

often intense, and was exacerbated by hyperpyrexia. When localized, it was usually frontal in distribution.

Generalized myalgia occurred in about one-third of the cases. Several of the children complained bitterly of leg ache. Five children had backache or neck pains. In 2 instances the association of high fever, headache, backache and neck stiffness led to spinal fluid examinations but results were negative in each instance.

Respiratory symptoms were unusual. A minority of the children mentioned dryness of the throat and cough was present in only two instances. Only 3 children had generalized upper respiratory infections following the febrile course. Conjunctivitis occurred in 4 cases considered as typical and in 4 of 8 possible cases. In several of these, the conjunctivae were mildly injected, with lacrimation or mucoid stickiness of the lids. In 3 instances, however, a rather violent conjunctivitis was present, with subconjunctival hemorrhages in 1 case.

Gastrointestinal symptoms were minimal. Of the 40 cases, 4 had nausea or vomit-

TABLE 1
SYMPTOMS OF THREE-DAY FEVER—40 CHILDREN

Temp. 103° F. or more	26	Conjunctivitis	4
Headache	23	Cough	2
Myalgia or leg pains	11	Nausea or vomiting	5
Backache or neck pains	5	Abdominal pain	2
Three-day duration of fever	24	Diarrhea, chilliness, paresthesia, drowsiness..	1

elevations of 103-4° F. With hyperpyrexia, the headache, discomfort and restlessness were usually pronounced; between elevations of temperature the children often felt so well that it was difficult to keep them quiet or in bed. After two to four days, the temperature subsided rapidly and the child, in the words of one mother, "got well as dramatically as he became ill".

Headache was complained of by every child over five years of age, and by several of the three to five year olds (Table 1). This headache often vanished after 24 to 48 hours, although it sometimes lasted throughout the febrile course. It was

ing, 1 had loose stools and 1 complained of abdominal pain. Three of the 8 "possibles" had loose stools and vomited moderately. Anorexia usually accompanied the febrile course, but appetite was regained rapidly.

Less frequent symptoms were: drowsiness in two instances, one child continuing to be unusually drowsy for nearly a week after subsidence of fever; restlessness in infants and younger children; chilliness as a definite complaint by 1 child; and temporary paresthesia in 1.

Duration of the illness varied from 24 hours to 6 days in the cases considered typical, and averaged 3.3 days. In 24 of

40 instances, the duration was exactly 3 days, hence the name "three-day fever". In the cases considered "possible", duration was more variable, from 2 to 10 days, with an average of 4.5 days.

PHYSICAL FINDINGS

On examination, these children showed a paucity of findings. Mild to moderate injection of the pharynx was frequent but not invariable. Pulse and respiratory rates were proportionate to the temperature elevation (Fig. 1). Absence of skin rashes and lymphadenopathy was striking. The spleen was palpated in only two instances. As noted under symptomatology, a few children had conjunctivitis, possibly fortuitous. Generally, the children did not seem as prostrated or toxic as might ordinarily be expected with the degree of hyperpyrexia noted. Despite headache and myalgia, only two children exhibited stiffness of the neck or back and no other abnormal neurological manifestations were elicited.

LABORATORY DATA

Extensive laboratory investigations were not made. Single blood counts were secured from 15 of the children who were considered to have typical attacks (Table 2). The leucocyte counts were normal to low, and less than 10,000 cells per cu. mm. in every instance (Table 2). The differential counts varied, a preponderance of neutrophils occurring in 9 instances, of lymphocytes in 6. Eosinophile counts tended to be low. Erythrocyte counts and hemoglobin estimations gave normal values.

Through the cooperation of one mother, a former laboratory technician, daily blood counts were secured from her children, eight and six years of age, as well as temperature, pulse and respiration recordings (Fig. 1) on the younger child throughout his illness. Both children exhibited characteristic symptoms of sudden fever, headache, muscle pains and anorexia of four days duration. These blood counts (Table 3) presented our first opportunity to note changes which occur in the hemogram during and after this infection. Slight fall in the total white counts, which were never

high, occurred after subsidence of fever. The relative neutrophile preponderance during the illness shifted to the nearly equal neutrophile-lymphocyte ratio expected at this age. The younger child, who also has asthma, showed transient depression of eosinophiles, with return to their usual level of 7-9 per cent as his infection subsided. Atypical lymphocytes, similar to those which we have found in many other virus infections,¹ were present on one or more occasions. Appearance of these atypical lymphocytes in smears from B. M. only in the latter part of his illness and their increase during the two days after recovery may explain failure to find them more than twice among 15 blood examinations from the other patients (Table 2).

TABLE 2
BLOOD COUNTS IN TYPICAL CASES

Patient	Age	Day of Illness	Leucocyte Count	Neutrophiles per centum	Lymphocytes per centum	Eosinophiles per centum	Basophiles per centum	Monocytes per centum	Atypical Lymphocytes
B.D.S.	5 mos.	1	9800	50	40	2	0	8	—
R.A.	6 mos.	2	9500	26	64	0	0	10	—
D.R.	2 yrs.	2	5950	19	74	2	0	5	—
S.L.P.	3½ yrs.	2	4800	50	40	1	0	9	—
A.R.	3½ yrs.	2	6100	37	55	2	0	2	—
M.S.	5 yrs.	2	9900	60	35	1	0	4	—
J.E.	6 yrs.	1	9200	95	4	1	0	0	—
D.M.‡	8 yrs.	2	3450	43	45	3	2	7	—
B.L.	11 yrs.	2	4250	56	33	0	0	11	—
T.P.	7 yrs.	4	9550	45	47	0	0	8	+
J.M.	1½ yrs.	*	8950	30	63	1	1	5	—
B.B.	5 yrs.	2	5300	56	29	1	0	14	+
B.B.	3 yrs.	3	5200	50	43	3	0	4	—

‡Stiff neck. Spinal fluid cell count 2, normal globulin.

*One week after illness.

Pharyngeal smears from 2 children showed a mixed flora, with a scant growth of *Beta hemolytic streptococcus* in one culture, *staphylococcus albus* in the other. Smears from the eye in two instances of rather severe conjunctivitis showed no organisms and few or no pus cells. However, a number of vacuolated mononuclear cells were found.

Examinations of urine were normal in

TABLE 3
DAILY BLOOD COUNTS IN SIBLINGS WITH TYPICAL ILLNESS

Patient	Date	Day of Illness	Highest Temperature	Leucocyte count	Neutrophiles per centum	Lymphocytes per centum	Eosinophiles per centum	Basophiles per centum	Monocytes per centum	Atypical lymphocytes
L.M. 8 yrs.	9- 6-47	3	102.2	8750	66	19	2	0	13	occas.
	9- 7-47	4	100	8888	43	46	5	0	5	0
	9- 8-47	....	98.8	7900	45	45	0	0	10	0
	9-12-47	....	.....	7650	45	40	6	0	6	0
	9- 7-47	1	101.8	7000	60	30	2	0	8	0
	9- 8-47	2	103.4	7500	57	36	3	0	4	0
B. M. 6 yrs.	9- 9-47	3	102	8150	57	39	1	0	3	1%
	9-10-47	4	100.4	7900	57	24	6	1	12	2%
	9-11-47	....	98.6	7900	42	43	7	1	7	2%
	9-12-47	....	.....	6150	47	27	9	1	16	3%

7 instances. Two voided specimens contained traces of albumin and a moderate number of pus cells; only one of these was considered to be indicative of urinary infection. This cleared rapidly under treatment and the child's illness in other respects seemed typical of "three-day fever", apparently acquired from a sister who had had a similar episode five days previously.

COMPLICATIONS AND SEQUELAE

Evidence available from this group of patients indicates that complications and sequelae must be infrequent. The conjunctivitis described in 4 typical and 4 possible cases was present from the onset. Organisms were absent from smears and vacuolated mononuclear cells were present instead of neutrophilic pus cells, a finding which we have observed in other nonbacterial (presumably viral) types of conjunctivitis. Present evidence is inadequate to warrant conclusions as to whether conjunctivitis is an integral part of the symptom complex in a minor percentage of cases, whether the 8 cases with conjunctivitis represent infection with an agent different from that of "three-day fever" or whether the conjunctivitis was simply an intercurrent infection. None of the children showed

generalized mucosal inflammation such as is described in the Stevens-Johnson syndrome.⁴ Three instances of upper respiratory disease almost certainly represented intercurrent infection, also an attack of acute tonsillitis which 1 child developed as the "three-day fever" subsided. There were no instances of pneumonitis, otitis media, or other pyogenic infections and no indication of involvement of any internal organs.

DIFFERENTIAL DIAGNOSIS

When an individual child is found to present the symptomatology of sudden high fever, headache and possible generalized myalgia, with physical findings limited to injection of the pharynx, definitive diagnosis may be difficult. This is especially true during a season when various virus infections are prevalent, since it is known that many of these diseases—for example, influenza, poliomyelitis, dengue, hepatitis—are accompanied by subclinical or milder examples with only generalized atypical symptoms. When, however, numerous individuals exhibit symptoms as described above, in the absence of typical manifestations of other virus infections, one is justified in suspecting this "three-day fever".

TABLE 4
PREVIOUS VIRUS INFECTIONS—30 CHILDREN

Acute Upper Respiratory Infections.....	20	Measles	8
Gastroenteritis	10	Chickenpox	5
Influenza	4	Roseola Infantum.....	3
Gingivostomatitis	2	Mumps	10
Poliomyelitis	2	Previous Attack of 3-Day Fever.....	2
Infectious Mononucleosis.....	1		

Roseola may be difficult to differentiate from "three-day fever" until termination of the febrile episode *without* appearance of the characteristic rash of roseola. However, intense headache and myalgia are infrequent in roseola; it is more likely to affect younger children and the blood count during the febrile stage of roseola demonstrates a relative lymphocytosis with leucopenia in nearly every instance.

Acute pharyngitis or tonsillitis of bacterial origin may offer difficulties in diagnosis of the individual case, especially if cultures are not made or are indecisive. The pharynx or tonsils are more inflamed by the second day than is expected with "three-day fever" and the white blood count is usually higher, but these may be deceptive. Response to therapy with sulfonamides or penicillin may be expected in these bacterial infections.

Malaria, typhoid, typhus, tularemia, undulant fever and similar continued fevers may be thought of, and one must depend on laboratory procedures and course of the disease to differentiate such infections; this is also true of infections of the urinary tract and many other febrile illnesses of childhood in their inception.

TREATMENT

Twelve children were given penicillin or sulfonamides, either through uncertainty in diagnosis or as a therapeutic trial. No response was noted to these agents or to quinine, which was given to 2 children whose spleens were enlarged. Since this is a self-limited disease, treatment need be directed only toward making the child comfortable, with adequate fluid intake and carbohydrates to prevent dehydration or ketosis. In the 8 instances where conjunctivitis was present, therapy seemed unavailing except as a matter of comfort.

SUMMARY AND CONCLUSIONS

Forty cases of so-called "three-day fever" are reported. Eight additional cases, presumably of the same nature, but in which atypical features occurred, are included. All 48 were observed during the latter part of the summer of 1947, at a time when other diseases of known virus etiology were at a low ebb in this community. Striking

features of the disease were sudden onset of moderate to high fever, severe headache, often myalgia, and the absence of notable involvement of respiratory or gastrointestinal tracts. The illness tended to persist for about 3 or 4 days and to vanish as suddenly as it appeared.

Results of routine laboratory procedures suggested a nonbacterial etiology. An epidemiological survey, though limited, pointed toward person-to-person mode of spread with incubation period of four to seven days. The disease does not seem to be highly contagious. Treatment with the various sulfonamides and antibiotics was ineffective.

For reasons mentioned and because of certain experiences in the past, we are inclined to believe that "three-day fever" represents one of the many ill-defined acute infections of childhood due to viral agents.

ADDENDUM

Since the above was written, a report from the U. S. Public Health Service Laboratory, Montgomery, Alabama,⁵ suggests on the basis of serum neutralization tests that the virus of pneumoencephalitis of fowls (Newcastle disease) is the etiological agent responsible for epidemics of a similar acute illness occurring among children (and occasionally found in adults) in Tennessee and Alabama during 1947 and 1948.

It is perhaps significant that laboratory personnel working with the virus at that time also exhibited changes in serum neutralization from negative to strongly positive after developing an acute influenza-like illness.

Sera from several children in our series, independent of the above studies, have been reported by the same laboratory to show positive neutralization tests. Conclusive proof by isolation of the Newcastle virus from a human case has not been accomplished.

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KEROSENE POISONING*

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NEW ORLEANS

Since the first case was reported in 1897,¹ the importance of kerosene as a cause of accidental poisoning has been widely recognized. Despite a large clinical experience with the effects of this agent, many fundamental questions concerning causes of these effects remain unanswered. It is our purpose here to review briefly some of the known chemical properties of kerosene, the nature of the lesions it produces, and a rather large clinical sample of 252 cases observed at Charity Hospital in New Orleans during the past ten years; by these means it may be possible to arrive at a few conclusions having practical therapeutic merit.

BACKGROUND

Kerosene is a variable mixture of hydrocarbons secured in the process of refining petroleum. It has a distillation range of from 200-600° F. and is relatively non-volatile. Because it is a mixture and not a chemical compound, one would expect chemical reactions and physiologic effects to vary widely with samples of varying composition. The only regulation governing kerosene production or marketing, as it affects the public welfare, is one forbidding a flash-point lower than 110° F.

Its composition varies with the type of crude oil from which it is separated, as well as with the refining process used. Aside from petroleum hydrocarbons of varying

volatility, it may also contain traces of sulfur, nitrogen compounds, caustic alkalis, and a number of other impurities and solvents. These are present in very small amounts (sulfur not in excess of 0.45 per cent) and the chances that such impurities are responsible for significant toxic effects seem negligible.

The real source of toxicity is probably in particular hydrocarbons. Although definite proof is lacking, it has been pointed out by Machle² that of the olefin, naphthene, paraffin and aromatic hydrocarbons present in kerosene and gasoline, the latter two are the most likely offenders. Gasoline, with its higher concentration of aromatic hydrocarbons, is probably more quickly absorbed, but it is reasonable to suppose that kerosene mixtures otherwise act similarly.

It has been estimated that individual batches of kerosene are ten to twenty times more toxic when given intratracheally than when introduced into the gastrointestinal tract.³ It seems that for man as well as for experimental animals, older individuals suffer fewer ill effects than do younger ones. In addition to variations in make-up of kerosene mixtures and age of patient, opportunities for aspiration, individual susceptibility, and the kind and amount of gastric contents might also be expected to have effects on symptomatology.

In the American medical literature we discovered reports of only six autopsies of human subjects who died from kerosene poisoning. Pathologic changes were strikingly similar to those observed in animals; these reflect three apparent actions—irritant, lipolytic and anesthetic. It seems likely that central depression results at least partly from lipolysis. Since kerosene contains hydrocarbons similar to those commonly used for anesthetics, it is natural to expect that similar central effects would be frequently observed.

The most striking pathologic changes are those invariably present in the lungs. These consist of a variety of lesions, but most commonly patchy or confluent inflammatory edema apparently related to direct irritant effects. Also observed are broncho-

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pneumonia, bronchiolitis, tracheobronchitis and even ulcerative tracheitis. Three instances of pneumothorax and subcutaneous emphysema have been reported; apparent pneumopericardium was also noted in one of these.⁴⁻⁶ Lesions observed in other organs are largely explainable on the basis of anoxemia. Cloudy swelling of the liver and kidneys was present in all. The odor of kerosene has been reported from the freshly cut surface of the lungs, of course, but also from the liver.⁷

Direct irritative effects are observed in the gastrointestinal tract where hyperemia, edema, and even ulceration of the mucous membrane may be found in such sites as the mouth, pharynx, esophagus, stomach, and intestines.

Explanations of mechanisms by which kerosene produces pulmonary effects are controversial. Briefly stated, there are two views: one which maintains that lethal effects ensue only if kerosene is aspirated into the tracheobronchial tree, and the other which holds that dangerous amounts may be absorbed from the gastrointestinal tract. Undoubtedly both obtain, though practically the latter seems relatively unimportant. According to this view, extensive pulmonary lesions may be produced by the actions of toxic substance which are absorbed into the circulation and then excreted through the pulmonary alveolar walls.⁸ On the basis of animal experiments, pulmonary lesions more clearly result from direct aspiration. Waring⁹ and Lesser, *et al.*¹⁰ found no pulmonary lesions unless aspiration had occurred.

The evidence brought forward by such investigations is based on experimental work which is difficult to interpret and which, in some instances, was so organized as to be unphysiologic and hardly related to the problem of poisoning in children. For example, in some experiments pulmonary lesions were found after kerosene was injected directly into the blood stream. This is a type of kerosene poisoning not yet achieved by even the most ingenious toddler.

While speculation cannot lead to definite

conclusions, some inferences can be drawn. It is almost certainly true that some fraction of kerosene is absorbed from the gastrointestinal tract into the blood because its common anesthetic action could hardly be explained otherwise. Such anesthetic effects are often seen in children who *never* develop pulmonary lesions. Also, as noted in Table II, pulmonary abnormalities are present clinically in about one-third of the patients who had no history of circumstances to suggest the likelihood that aspiration had occurred. It seems reasonable to believe that the variable composition of kerosene mixtures accounts largely for the diversity of effects observed clinically and experimentally, but that prognosis depends largely on the amount aspirated. In one of our patients, a single teaspoon of kerosene produced death; 2 other children of about the same age, who took as much as 16 ounces each, had no symptoms to suggest that aspiration had occurred, and had no more than transient systemic evidence of toxicity. Certainly, most reports agree with our experience indicating that aspiration into the tracheobronchial tree is the most important consideration by which outcome may be predicted. None of the reports dealing with fatal kerosene poisoning so far have included any chemical studies designed to determine which, if any, particular hydrocarbons seemed to be most likely responsible for lethal effects. If these could be identified, it might be possible to control composition of kerosene mixtures at refineries and thus reduce present hazards to some extent. We hope to report our current work along this line in the near future.

EXPERIENCE AT CHARITY HOSPITAL

At the Charity Hospital in New Orleans for the ten year period of 1937-1947, there are 252 records of kerosene ingestion by children. Seventy-eight per cent of these were in negroes. Ages ranged from 5 to 72 months, and 97 per cent of the patients were between the ages of 6 and 36 months. These figures serve to illustrate the fact that this, like most accidental poisonings, is most frequent in the toddler or runabout age. It is most common, of course, among

groups who use kerosene most frequently for cooking, heating, or lighting and leave it standing about easily available to the small child. Because kerosene is so often stored in bottles, cans, and jugs, and is clear, many children ingest it in the belief that they are taking water; some actually seem to like it—how else could one explain the voluntary ingestion of as much as 16 ounces at one sitting? During this ten year period at Charity Hospital, kerosene ranked first among causes for accidental poisoning in children requiring admission, and fourth among causes of death in this group.

There were 9 deaths among these 252 patients who took kerosene, a fatality rate of 3.6 per cent; this is considerably lower than that of 9.5 per cent obtained from a review of the American literature, which discloses 21 deaths among 220 cases of kerosene poisoning which have been reported since 1897. This difference, of course, is due probably to the fact that most other reports are concerned with small groups and more serious effects. The frequency of the most common clinical manifestation in our patients was compared with a smaller group for which description could be gathered from these other clinical reports which have appeared during the past fifty years.

TABLE I
EFFECTS OF KEROSENE POISONING

	252 Cases Charity Hospital	59 Reported Cases
Pulmonary effects	42%	66%
Aspiration	76%	89%
CNS effects	56%	86%
Cardiac effects	17%	22%
G. I. effects	11%	8%

Though these groups are not strictly comparable, it should be noted that effects on the pulmonary and nervous systems dominate the picture and that expected evidences of gastrointestinal disturbances are relatively inconspicuous. We have not seen nor have we been able to discover a reported death due entirely to depressant effects on the central nervous system. Neither have any been attributed primarily to cardiac, hepatic, or renal failure. Everything points to pulmonary irritation and

edema as the principal and most obvious direct cause of death. One might speculate a bit about the findings in Table II. Perhaps relatively small amounts of hydrocarbons reaching the lung only from the circulation, being more dilute, would produce less severe irritation. On the other hand, if aspiration occurs, the insult to the lung is sudden and direct, resulting from a larger and more concentrated dose of toxic hydrocarbons.

No matter what our current experimental studies may indicate concerning the mode of action of kerosene in the production of pulmonary edema, it is apparent at the present time that all deaths have occurred following aspiration, that depressant effects have sometimes been alarming but never fatal *per se*, that gastrointestinal effects seemed of little consequence, and that rational therapy of kerosene poisoning should have as its chief objective the prevention or amelioration of pulmonary edema.

TABLE II
SIGNIFICANCE OF ASPIRATION

	Charity Hospital Group	Reported* Group
Positive History	76%	89%
Abnormal lungs	47%	53%
Died	3.7%	17%
Negative History	24%	11%
Abnormal lungs	33%	83%
Died	0	0

*Incomplete

DISCUSSION

These patients should be carefully appraised when first seen, and classified into one of four groups having an increasingly poor prognosis: (a) Those with only a history of ingestion and no neurologic or pulmonary abnormalities; (b) those with predominant anesthetic effects—drowsy, stuporous or comatose; (c) those in whom circumstances indicate that aspiration might have occurred, and who have respiratory disturbances; (d) those who are depressed and also have signs of pulmonary edema. Patients may move from one group to another with astonishing rapidity. Four lines of attack are open: (1) General supportive measures; (2) management of central nervous system

effects; (3) treatment of pulmonary edema, and (4) prevention or treatment of complications. It is apparent that such lines of therapy will have to be carefully individualized.

General supportive measures are as important in kerosene poisoning as in all other types of poisonings. Occasionally, gastroenteritis may lead to dehydration, electrolyte imbalance, and even medical shock. These should be quickly corrected by usual measures.

Treatment of central nervous system effects. Since fatality is invariably associated with pulmonary edema, it is probably unwise to use mechanical or medicinal stimulants which increase cardiac and pulmonary work. There is probably no good reason for trying to keep these children alert. Perhaps the most sensible method of treating coma or stupor is to take advantage of the opportunity it affords, to lavage the stomach while there is relatively little danger of causing vomiting or aspiration. Having taken advantage of the anesthetic action of kerosene to remove what part of it is left in the stomach, one might then reasonably employ simple stimulants such as caffeine, amphetamine (Benedrine), and ephedrine. Response to caffeine may be especially valuable when it is given in conventional small amounts as a means of differentiating physiological sleep from early stupor.

The treatment of pulmonary edema is most difficult. Though the mechanism for its production is poorly understood, absorbed kerosene may play some role; we have seen pulmonary edema improve on several occasions *after* removal of kerosene from the stomach and we have seen children who developed severe respiratory distress only *after* they had fought, gagged, struggled, and undoubtedly aspirated during ill timed attempts at lavage. Whenever it is possible to do so, *without increasing dangers of aspiration* the stomach should be lavaged. The only other therapy which holds promise is the administration of oxygen, since death in pulmonary edema is due, literally, to drowning. As Drinker¹¹ has pointed out, pulmonary edema and alveolar

capillary anoxia constitute a vicious and self perpetuating cycle. The opportunity to break this must be seized *before* or at the very first sign that fluid is accumulating in the lungs. At this time oxygen should be given in as high a concentration as possible. Ideally, oxygen under positive pressure would be desirable but as yet there is no practical method by which this can be effectively accomplished with small and uncooperative children.

Measures employing hypertonic solutions for the alleviation of pulmonary edema have not been satisfactory in our experience. Fifty per cent glucose and sucrose solutions have only transient action; four times concentrated solutions of plasma undoubtedly have a more sustained effect but, after the administration of useful amounts, sodium tolerance is often exceeded and the situation may be worse than it was before. Salt-free serum albumin is theoretically an ideal agent but we have not had sufficient experience with it yet for fair evaluation. It could hardly be expected to ameliorate existing irritant lesions or remove much of the fluid already filling smaller air passages.

Treatment of complications and delayed effects involves prophylactic use of antibiotic and chemotherapeutic agents to prevent or treat pneumonia or other respiratory infections. Additional therapeutic measures may be indicated by particular circumstances. Hyperventilation and postural drainage may be instituted for atelectasis and as prophylaxis against later bronchiectasis. Such measures are begun only after the twelve-hour danger period has passed. Late liver damage is a theoretical complication which we have not observed.

SUMMARY

The ingestion or aspiration of kerosene is a common household accident among small children. The course of resultant symptoms is extremely variable but frequently leads to death from pulmonary edema within eighteen hours.

In a preliminary way, we have reviewed only fragments of a large clinical experi-

ence and have tried to make a few rationalizations for therapy based on what is known of the composition and physiologic effects of this variable mixture of hydrocarbon compounds.

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SOMATIC SUBSTITUTIVE REACTIONS IN ADOLESCENTS

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NEW ORLEANS

More than thirty years ago Adolf Meyer¹ directed attention to the importance of treating not only the diseased organ but also the patient when he wrote, "of late years we have learned to realize that indeed some disorders can be explained, and treated, as abnormal and unhealthy ways of the person rather than as disorders of any special organ." Within recent years new terms such as "psychosomatic" have come into wide usage to cloak this old urge to consider the person as a whole. Unfortunately, this new name has not carried further meaning for many people, and the medical attack in the direction of a specific

organ continues, not through lack of insight of the physician alone, but often through fault of the patient who demands that his complaint be attacked with vigor and dispatch. This puts the physician on the defensive and demands that he assume full responsibility. The well intentioned "masterful waiting" frequently gives way to active manipulation which may well become involved, confusing, and unavailing to both physician and patient. In such a situation the well meaning therapist can reach a point where iatrogenesis replaces the original difficulty, and subsequent investigations become more troublesome for the next medical examiner.

This paper will be concerned briefly with the somatic distortions which can occur in late adolescence and a few illustrative cases will be cited. Much literature has appeared regarding social and emotional adjustment of the adolescent, but a search of the medical literature fails to reveal much information concerning the somatic complaint and its meaning and management during the adolescent period. This is true in spite of the fact that medical histories all too often reveal that the first of a series of operations in the nurtured neurotic patient occurred during adolescence.

Adolescence has been defined by Webster as "the state or process of growing up from childhood to manhood or womanhood" and for practical purposes is an acceptable definition. During this growth process healthy preparation must be made, lest backsliding occur to a less mature way of reacting. During this period it becomes increasingly apparent to the youth that he must assume more and more initiative and decrease his dependence on his parents.

Between fifteen and twenty years of age he must make serious preparation for what he will do with himself both socially and economically during adulthood. There are those adolescents who welcome this new found freedom with zest and without seeming trouble, often to the consternation of the fond parent who until this time thought himself indispensable in all the youngster's decisions. If the adolescent's early nurtur-

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ing has occurred amidst family harmony, and if the parents continue to mature to senescence as normal people should, there will be little likelihood of difficulties. If, however, the maturation process between parent and child has not followed the natural plan, but instead a contagious emotional immaturity has existed, then a recrudescence of earlier unsolved conflicts can be forced to the surface to confuse the issues of adolescence itself.

If obstacles are encountered in the development toward self-assurance, inner security, and the ability for independent action, somatic distortions will surely appear. One type of distortion is the fleeting, somatic, substitutive reactions for some psychic pain. Some years ago this simple type of escape response was brought dramatically to my attention. At the time I was summoned by an astute internist to consult with him concerning two girls who had been brought to a college infirmary late one evening. One of them came in to the nurse on duty, bent over, holding her side and complaining of severe abdominal pain. The second girl came in an hour later, sobbing because of acute abdominal pain and vomiting, and asserting, "I have appendicitis." Both girls were acutely ill and had elected the appendix as the culprit. Actually, in much more time than it takes to relate, their problem was found to be an acute case of "Hellenism" for each was greatly disappointed when she failed to receive a bid to a certain sorority.

All physicians have been faced with such psychologic phenomena, and yet such an experience makes a lasting impression under such dramatic circumstances. Such cases, if recognized, are easily handled just as the "arithmetic stomach" of the little boy, who has failed to prepare his lesson, is equally easy to manage.

If, in the case just cited, we also had had to manage the families of the girls, complicating factors would automatically have been injected into the situation. The girls would not have readily admitted their problems perhaps, and the mothers might have asked embarrassing questions, such as how

could the physician be sure there was nothing seriously wrong. It is easy to see how the practitioner, thrown on the defensive, could have been drawn into the child's somatic conspiracy. The next step would have been to yield to the families interference and allow a simple condition to become more protracted. There could have followed a rigid somatic vigil, repeated clinical examinations and perhaps even prophylactic elective appendectomy. In such a case the psychic retreat of the patient is apt to be cut off, and a somatic focus begun.

Although all of this is elementary enough, such incidents happen again and again. Of course, there are much more complicated cases than these, in which the psychologic problem has progressed beyond the simple conversion phenomenon, and the somatic disturbance is of longer and more deep seated significance. Often these prove most stubborn to handle and require long term treatment. A few such cases might be cited here.

CASE REPORTS

Case No. 1 An 18 year old boy reported to us with a chief complaint of frontal headache of more than a year's duration, increasing fatigue and general nervousness. In December 1945 while being examined for induction into the army he fainted. He was rejected subsequently and upon his return home his disappointed father demanded an explanation. The boy could only answer for physical reasons. There followed a number of visits to physicians to determine the cause for rejection. Unfortunately, he did have a low grade fever. The first physician decided that his tonsils should be removed. Still nervous, he was given iodine for a week but this only made him worse, and he began to notice dizzy spells and weakness. Not doing well, in March 1946 he received 50 injections of penicillin in a hospital. Following this he complained of frontal headaches, was thought to have sinusitis and was given more penicillin. In May 1946 he again ran a low grade fever and his local physician, believing he might have endocarditis, gave him more penicillin. At this point he was informed he had heart trouble and was put to bed. All of these diagnoses convinced him that there was something seriously wrong with himself. However, fortunately, at one more visit to a physician it was recognized that his difficulty was a psychiatric problem.

When we first saw him, he walked slowly, bent forward, and talked only in cautious low tones about himself. He was convinced he was seriously

ill. He was an asthenic, underweight boy, 5 feet 6 inches tall and weighing 114 pounds. There was mild hypertension. The electrocardiogram was normal except for sinus tachycardia. Urologic study revealed no abnormalities, and a urethral discharge proved to be only spermatorrhea. All laboratory studies, including hematologic, serologic, and stool examinations yielded negative results. Urine clearance tests gave normal results. Bacteriologic examination for febrile antigens including those for *Brucella* gave negative results. Otorhinologic examination including roentgenograms of the paranasal sinuses revealed no abnormalities and another roentgenogram revealed a normal chest.

Casual inquiry disclosed a retiring, shy boy who lived in a household filled with aggressive, high tensioned people. He made such statements as, "My mama is pretty nervous, and when I start doing something, she fusses at me. Everything has to be in its place. My brother is mean, and bothers me too." In addition to having difficulty with the mother and brother, it was eventually discovered that the boy was fearful of his father who, not understanding his retiring son, anxiously pushed him, and not getting a suitable response often became angry with him. It was also learned that his recessiveness excluded him from normal social outlets; he was fearful of girls and distrusted himself in social gatherings.

His illness was definitely part of the pattern of his retreat and unfortunately was aided by the somatic focusing by those he consulted, to the exclusion of the psychic factors. This was largely due to the uncompromising father, who had to know exactly why this son was turned down to the father's own embarrassment. This boy was seen only three times and the obvious psychologic factors in his adjustment were worked out with him. When last seen he was greatly improved but still in need of supportive psychotherapy.

Case No. 2. Miss B., a 19 year old college girl, while attending a party at the age of 15 years, fell and complained of a painful back. Three months following the fall she felt pain in the right thigh and leg. Ten months later she experienced a similar pain in the left leg. The pain in her back was of varying severity but constant from the time of the accident. It was worse in the afternoon and was aggravated by exercise. It did not interfere with sleep but she would awaken tired in the morning. Her pain was never completely incapacitating but did interfere with daily living and caused her to withdraw from groups and later from school.

Examination of the back when first seen in December 1944 gave no indication of any definite neurologic or orthopedic problem. She was followed at irregular intervals for this and other complaints (dysmenorrhea, painful breasts, and fainting attacks). There was a note in her record

by a surgical consultant dated August 1945 which read, "I can't understand this girl. It looks as though she doesn't enjoy living." Two months later the same consultant wrote, "This isn't a disc syndrome; I will avoid operating on her as long as possible."

During this time the patient was also being treated by orthopedists and had been wearing a back brace which she would not discard. After seeing her five times over a period of ten months, they too considered her to be psychoneurotic. They did, however, hospitalize her for a brief period to apply extension to her limbs to correct the back pain. Following this she experienced dramatic relief and was described as having "much less hypochondriacal or neurotic tendencies."

It is not possible to set down in words the emotional atmosphere that must have pervaded the contacts between the physician, the patient, and especially the mother. The mother in this instance was an aggressive person who could never accept a functional formulation of her daughter's back pain. Because of this we lost sight of her for approximately eighteen months, and when next seen in June 1947 the girl had had a spinal fusion. The frustrated surgeon had told the aggressive mother that he could not understand why the patient was not well following the fusion and that he could offer no new help.

About two and a half years after we first saw her and approximately five years from the date of onset of her trouble, we started treating her for the functional problem. It was with difficulty that the family and particularly the mother could be convinced of the need for psychiatric care. It was obvious to us from the beginning that the girl was hysterical and from even a cursory investigation of her longitudinal history it would have been apparent to others. Headaches of a tensional type, episodes of vertigo, feelings of faintness, occasional complaint of pain over the bridge of her nose, occasional attacks of sharp pain in the lower part of the abdomen from an early age not relieved by appendectomy at eleven years of age, bouts of nausea and vomiting, and dysmenorrhea appeared prominently in the history.

The patient has now been treated over a period of ten months, for a total of eighteen interviews, during which time there has been a complete change so far as her somatizations are concerned. Her incapacitating headaches have disappeared, the backache has become a mere point of tenderness, and her menstrual cramping no longer keeps her in bed. Much discussion has centered around her interpersonal relationships, which have been all along the crux of her problem. The original accident giving rise to a painful back occurred at a party where she had been having a perfectly miserable time. There previously had been a consistent pattern of reacting with illness to trouble-

some life situations. The patient always had to compete with a younger and more attractively gregarious sister. From early school days her process of socialization had not developed smoothly, and she was inclined to focus her hostile feelings on such factors as her need to wear glasses to account for her self-consciousness. She was a tempestuous person, quick to criticize in order to forestall criticism of herself, and rigid and stiff in her associations. One might even surmise that her stiff back was symbolic of her entire self.

By means of distributive analysis this girl has been able to change a great deal. She is now attending college, taking vigorous extracurricular activities, and dating much more; she has plans for a career and has an entirely different outlook on life.

Case No. 3. Miss S., a 17 year old girl, consulted us after having had three fainting attacks. For the first of these she was observed in a hospital, and the physician was impressed that she was nervous and overworked (she was working her way through high school), but this inclination toward somatic thinking caused him to make a diagnosis of chronic myocarditis with myocardial ischemia at the time of discharge. One month later, she was re-admitted to the hospital in a semiconscious condition following an attack of dizziness in school. She was discharged and recovered three days later. Two weeks later a third episode occurred. It was then that some intracranial pathologic lesion was suspected, when, on this admission, she had what were regarded as intermittent episodes of loss of consciousness during a period of three days. The description of these was rather vague, but there had been lip biting, loss of sphincteric control, and other phenomena indicative of a grand mal attack. Neurologic examination and spinal fluid were normal. A pneumo-encephalogram gave negative results. Laboratory studies including an electro-encephalogram revealed no abnormalities. In addition to the fainting attacks she also complained of more or less constant but vague pains in both legs and polymenorrhea every two weeks which began at the same time as her manifest emotional illness.

It was learned that the patient was the second child of the mother's first marriage which ended in divorce while the patient was still an infant. Her father presently lives in an old soldiers' home and was always regarded as an inadequate person. A stepfather entered the family while the patient was extremely young, and a close relationship developed between them during her childhood. An older sister and the mother also paid a great deal of attention to her. Even now, the older sister is saving money so that our patient may attend a nursing school. At the age of 7 years she lost nearly a year of school because of varied illnesses, none of which were severe. Up to the age of 7 she was

regarded as "tomboyish," but then she began to change and become a conscientious student. It is significant that the father repeatedly fought with the patient from the age of 8 onwards. His moralizing caused her to become withdrawn to the point of her becoming obsessed with studies. It should be emphasized that the child thought of herself as a tomboy and was closely attached to this father who later came to rebuff her.

Then, at the age of 12 she saw the torn body of a close companion, who had been crushed by a truck. Not long after this she began to experience multiple somatic aches but especially pain in her lower extremities (her friends legs were crushed) which were continuous until only recently. These were long thought of, however, as rheumatic, and she spent long periods in bed. For several months the patient had complained of insomnia, and for years she had been subject to frightening nightmares.

This patient has proved rather resistant to psychotherapy. It has been with difficulty that she has been able to develop any appreciable insight. It has been hard to communicate with her and she participates with great trouble in a therapeutic discussion. It is not uncommon for adolescents to run the gamut from conscious dishonesty to complete rejection of help from an adult; their distrust of an older person may at times preclude a successful relationship with the physician, and his frustration may sometimes bring about an unwise, impatient decision. With only suggestive measures it has been possible to eliminate some of the child's symptoms. She has given up her leg pains; her menstrual function has returned to a normal rhythm. There have been two recurrences of the "fainting" attacks but these have been treated with more awareness of the psychic component. She attends school regularly and has become more active. Ideally, of course, treatment is being directed toward developing a person more willing for normal growth rather than a regressing person. What has been accomplished is the uncovering of a psychologic growth problem and the turning aside of the somatic focussing which has gone on for so long.

All physicians interested in psychosomatic relationships have wondered what determines the selection of a specific organ to receive the impact of an unpleasant situation. In general, it may be said that in all people there are potential organ dysfunction affect equivalents. In childhood varied physical attitudes are developed and once an emotion has become associated, this physical attitude is apt to recur. After an organ has responded a number of times to an unpleasant mental experience, specific physi-

cal expression can eventually occur without the corresponding mental experience which originally initiated it. It is then that the person becomes unaware of the emotional significance of his organic response.

This was true in the three cases cited and a more indirect approach to the problem was necessary to reorient the patients. In this more time consuming approach the varied attitudinal reactions must be looked into with patient understanding and with a view to synthesizing personality assets. Further than this, the patient must be willing and eager to try to understand how he lives within himself and what growth must take place.

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DISCUSSION

Dr. C. S. Holbrook (New Orleans): The paper that Dr. Harms has presented could almost be taken as a sermon and if the general practitioner would interest himself in these problems I am sure he would get a great deal of satisfaction from his efforts. The general practitioner is the one to see these children, these young people, when the conflict is fresh and where the analysis is easy. The psychosomatic unraveling, or the unraveling of psychosomatic problems in children is very much simpler than in adults and the physician who first sees the child, the family physician, is in a position of great advantages because he understands the environment, the family problems, and he has known the child, the family and what the child has to face. So a little effort on the part of the physician will frequently prevent a well developed psychoneurotic symptom-complex in three, ten or twenty years. Then the problem becomes more difficult, especially if it has existed for ten or fifteen or twenty years, when the actual cause of the problems are so deeply covered that they frequently cannot be brought out and they have become a part of the individual and are not readily given up.

It is well understood that the family physician is an unusually busy man and often he does not have the necessary time to go into the problem that is brought to him. In that case, if a more suitable consultation period can be selected, it is better to do this than to see the child, or the young individual, and get rid of him by telling him the heart is a little out of order, there is some colon trouble, the appendix is flaring up, or something like that. It is very much better not to prescribe for the patient but to give him another appointment at which time a careful history can be taken and one can devote enough time to the understand-

ing of the problem. There is nothing quite so important in psychotherapy as a careful physical examination. If one comes in complaining of palpitation and thinking he has heart trouble, it does not do much good to feel his pulse and tell the individual there is nothing wrong with him. People realize the need of a thorough examination. It may be too elaborate. It is a mistake to examine a patient time and time again when you feel disturbance is functional, because the patient begins then to feel there must be some question in your mind about his heart, etc., or you would not keep examining him, take skiagraphs of him, or make electrocardiograms or do other things unless you thought there was something wrong. When the physician is quite sure he is dealing with something functional it is a mistake to carry out an elaborate examination. Patients are frequently made worse by doctors' attitudes toward them and often these result from not being willing to devote sufficient time to the first interview. The first interview is decidedly the most important. Subsequent talks with the patient help to clarify things brought out in the first interview, but in most simple problems if one will give forty-five minutes or one hour to it, it can be readily cleared up and a little re-examination on the part of the physician and interpretation to the child and to the parents is frequently all that is necessary.

CONSIDERATION OF MANAGEMENT OF CHILD WITH RHEUMATIC FEVER*

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The objective of this presentation is to emphasize the importance of considering the treatment of the child afflicted with rheumatic fever in terms of management over a period of years or even decades. It is usual to pay close attention to the details of therapy during the acute attack when there are pain, fever, choreiform movements, or definite evidence of cardiac involvement; then, when the attack is subsiding and the child feels comfortable, all too often there is a tendency for the physician to be too lenient in relaxing his supervision. More and more we are becoming aware of this fact that it is fully as important to practice fastidious follow-up

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care in the patient with rheumatic fever as it is with the patient with diabetes or syphilis. We should think of the problem in terms of the rheumatic career of the individual. To facilitate a consideration of this concept of management, a schematic representation of the course of the disease is given, the duration of which may be in terms of either weeks, months, years, or decades. The greatest single determinant of the duration is the severity of cardiac involvement. The four phases of management, regardless of the total duration, may be considered as follows:

Acute—keynote—bed rest and symptomatic therapy

Subsiding—keynote—diet and restriction of activity

Convalescent—keynote—diet and graduated physical activity

Quiescent—keynote—prevention of recrudescences.

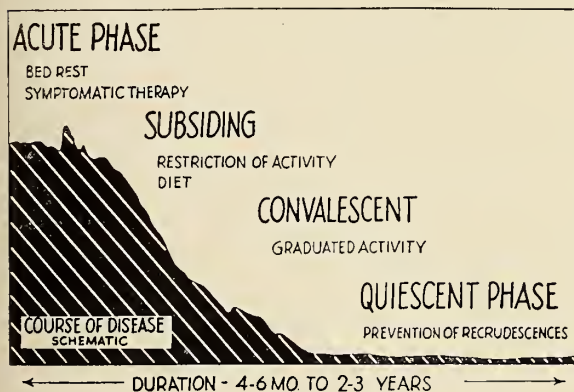


Fig. 1

Diagrammatic representation of the management of child with rheumatic fever in relation to the phase of the disease.

The shift from one phase of treatment to the other is not necessarily step-like. It may be rather sudden and abrupt, but is more apt to be smooth and gradual. One may liken the transition from one phase of the treatment to the other to the smoothness of the automatic shift in the modern car as compared with the more conventional definite shifting from low to medium and then to high gear. (To carry the simile further,

reverse gear may be thought of as the acute phase of the disease.)

In the above scheme of management of rheumatic fever (Figure 1) it is presumed that the diagnosis of rheumatic fever has been established or has been strongly suspected. The most valuable bit of information, or the most important guiding feature for changing the phase of management is an evaluation of the state of the "activity of the infection". To make this evaluation one must utilize all the data obtainable from the history, physical examination, and laboratory studies. If the child has fever, tachycardia, pain, choreiform movements, enlarging heart, subcutaneous fibroid nodules, rheumatic erythema, anemia, progressive electrocardiographic abnormalities, or a developing murmur or pericardial friction rub, one need have no doubt about the activity of the infection. Conversely, following the acute attack, if the child is gaining weight, has a good appetite, good color, and vibrates vigor and enthusiasm—in other words, radiates good health, there can be little doubt that the rheumatic process is no longer active. Between these extremes it is often difficult to make an evaluation. As always in such a situation all information obtainable must be taken into consideration and interpreted in terms of the child as a whole. For example, in a child who has a normal erythrocyte sedimentation rate, a borderline hemoglobin and leukocyte count, mild anorexia, with an occasional nose bleed, and who fails to gain weight, it must be assumed there is rheumatic activity. A moderate elevation in the sedimentation rate in the asymptomatic child with a good appetite and sense of well being, especially with no evidence of carditis, indicates that he may be considered non-active. Evaluation of the state of activity of the infection in the individual child should be made at intervals of two to four weeks in the early stage and later at intervals of one to two months.

In the ensuing discussion the attempt will be made to present in outline form pertinent points regarding treatment as related to the four phases of the disease. A more

detailed consideration may be found in a current publication of the proceedings of the American Academy of Pediatrics, in the Round Table on Management of Rheumatic Fever, by Fashena and the author (Pediatrics, March, 1948).

ACUTE PHASE

Pain, fever, and other acute symptoms.

Strict bed rest—to assist in this, sedatives such as phenobarbital may be helpful.

Salicylates—sodium salicylate or acetylsalicylic acid, 0.10-0.15 gm. per kilogram (grain per pound) body weight daily in divided doses four times per day. It is important to watch closely for signs of salicylate intoxication—the first sign usually being hyperpnea from central nervous system stimulation. Acidosis may develop even before such symptoms of salicylism as tinnitus and vomiting are very marked.

Oxygen—more and more it is developing that in the presence of carditis liberal use of the oxygen tent is helpful in reducing cardiac damage.

Diet—every effort should be made to maintain good nutrition using frequent small attractively prepared meals.

General supportive measures—pleasant environment, psychological reassurance, and mild entertainment preferably with no visitors; and body comfort such as removal of weight of bed clothes from painful joints. Seldom is it necessary to employ local heat, flannel wrappings, or methyl salicylate in oil.

Chorea minor.

Bed rest—with padding of hard surfaces for protection from injury. Quiet environment.

Sedation—very satisfactory is phenobarbital, 0.032 to 0.045 gm. three to four times daily until drowsy then decrease somewhat. Innocuous rashes develop occasionally. Other sedatives may be tried.

Diet—it is important to assist in the feeding of these children, and extra efforts, though time consuming, must be made.

Fever therapy—may be used in the severe cases.

Cardiac decompensation.

Strict bed rest—with liberal use of sedatives, even employing narcotics.

Oxygen tent—continuous.

Diet—low sodium with frequent small feedings.

Diuretics—employment of theocalcin or mercurhydrin.

Digitalis—use is controversial in the cardiac failure associated with acute rheumatic disease; however, it may be tried using Eggleston dosage. Electrocardiograms should be taken to check for digitalis intoxication.

SUBSIDING PHASE

Bed rest until rheumatic activity subsides.

Nutritious diet with liberal use of iron and vitamin supplements.

Diversional therapy—mild play activity in bed and later simple occupational tasks.

Emotional and psychological conditioning.

General supportive measures with limited visitors allowed.

CONVALESCENT PHASE

Graduated physical activity—it is well to plan a positive schedule. Actually such activity begins in the subsiding phase, however, individuality is the keynote with one-half to three weeks between each step in the following schedule:

Feed self—toys in bed—holding books.

Sit up in bed—fifteen minutes, then thirty minutes, once then twice daily.

Bathroom privileges—once then twice.

Diversional therapy—quiet games and reading.

Sit in chair—fifteen minutes then thirty minutes, once then twice daily.

Meals with family—first, dinner, lunch then breakfast.

Walk about house—fifteen to thirty minutes once then twice daily.

Out of door walking—fifteen to thirty minutes once then twice daily.

Limited school work at home.

Climb stairs once then twice daily.

Rest period—one hour in morning and two hours in afternoon—later one per day.

School—one or two classes—then half

day—then all day with rest periods during and after school.

This whole activity program may be weeks to months if no carditis, or months to years if carditis is severe.

Diet—continue with good nutritional program.

Education—planned according to disability—present and prospective.

Physical therapy—play, occupational and diversional program according to ability and reaction to increase in exercise.

Psychological and emotional conditioning—it is important to assist in keeping up morale and avoid allowing “do not do that” or “don’t do this,” and “remember your heart” to become the chief conditioning statements. Such admonitions go far towards developing “induced invalidism” which should be rigorously avoided. An optimistic cheerful attitude must be assumed.

Environment—insofar as possible favorable hygienic conditions and pleasant surroundings should be provided. Favorable climatic conditions are of assistance. In many instances this may be provided in the patients’ own home, but in some places superior convalescent homes with complete programs are available.

Removal of foci of infection—Foci in teeth, sinus, and tonsils should be investigated, and these should be treated. In the event operative procedures are to be carried out, sulfonamide or penicillin seems to be especially helpful in preventing the blood stream invasion, hence prevents the development of subacute bacterial endocarditis. It should be pointed out that removal of tonsils and adenoids is not effective in preventing subsequent attacks of acute rheumatic fever.

QUIESCENT PHASE

In general the same rules presented under Convalescent Phase are applied during this phase in regard to diet, physical activities, psychological conditioning, and educational and occupational programs. Particular emphasis is placed on the prevention of recrudescences. Measures which have been used are: Prolonged care in con-

valescent home, removal to a favorable climate, salicylate administration for a month when afflicted with hemolytic streptococci Group A infection of the throat; and periodic injections of tannic acid precipitated hemolytic streptococcic toxin. Penicillin has not been given any more than a preliminary trial. Particularly successful has been the continuous daily administration of sulfonamides to those individuals likely to develop recurrences of rheumatic infection.

When all signs of rheumatic activity have disappeared, such drugs as sulfadiazine or sulfamerazine 0.5 gm. may be given with breakfast and supper to those over ten years of age and 0.25 gm. twice daily to those under ten years. For the first week, one-half the expected daily dose may be given. Periodic examinations of the patients should be made for the first four to six weeks at weekly intervals and later at four to six week intervals. The hemoglobin, leukocyte, and differential white cell count, and blood sulfa levels, as well as urine examinations should be made. The patient should be kept under continued surveillance. It has not been determined as to how long such a regime should be carried on. Inasmuch as 80 per cent of the recurrences develop within five years, it would seem that this should be the minimum interval. Furthermore, the likelihood of recurrences before and after 15-16 years of age are 5:1. Therefore, it would seem that children should be kept on such a prophylactic program until after puberty.

Perhaps less than 1 per cent of the children succumb during the first attack of rheumatic fever, yet in a ten to twenty year follow-up period 20 to 40 per cent will have died. As physicians responsible for maintaining a good state of health for our patients we must recognize our responsibility particularly in regard to the patient with rheumatic fever, as much can be accomplished to alleviate the devastating effects of the disease which is the number one killer of the school age child. In so doing the incapacitating effect of one of the

chief disablers of our children and youth is greatly decreased.

In spite of the fact that the burden of a prolonged responsibility in managing the rheumatic career of the child seems trying at times, the realization of the benefit to be gained serves as the finest stimulus possible to prove the effort is well expended and gives satisfaction in its accomplishment.

ELECTROENCEPHALOGRAPHY IN CHILDHOOD

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When a highly technical procedure is first made available in any specialized field of medicine it usually requires a considerable period of time before its true worth and potentialities are disseminated to all physicians. This is eminently true of electroencephalography. In spite of the fact that the recording of electrical potentials from the human brain has been carried out for more than twenty years, most of the findings and data have been published in journals which do not come to the attention of the average physician. As a consequence, many otherwise well-posted physicians are not acquainted with technics, indications for the use of electroencephalography, and with some of the very valuable information which can be derived from it. It is the purpose of this paper to condense some of the material which pertains to the application of electroencephalography to certain problems of childhood. In general, investigations have taken the following trends:

1. Establishment of normal electroencephalographic patterns for children of various ages, ranging from the immediate newborn period through adolescence.

2. Determination of the effects of certain physiologic stimuli on the pattern of the brain waves (sleep, drowsiness, visual and other sensory stimuli, hyperventilation, hypoglycemia, etc.).

3. The study of cerebral electrical dysrhythmias which have their clinical counterparts in the various forms of epilepsy.

4. The localization of focal cortical abnormalities.

5. Attempts to correlate the pattern of the electroencephalogram with the personality of the child, especially in the case of so-called "behavior problem" children.

TECHNIC OF ELECTROENCEPHALOGRAPHY

The procedure of electroencephalography is based upon the fact that the countless cells of the cortex beat with an electric rhythm. These pulsatile potentials are part of the normal metabolism of nerve cells. While the potentials arising from individual cells are extremely minute, there is a tendency for groups of cells to beat in synchrony, so that sufficient potential is produced to permit amplification and recording in much the same way as in the electrocardiogram.

The reader who is interested in pursuing the details of the technic is referred to some of the many clearcut expositions of the method.¹⁻⁴ In general, small electrodes are attached to various positions on the scalp, good contact being assured by means of electrode paste. The electrodes are usually fastened to the clipped scalp by means of collodion, but they may be pressed against the scalp by various rubber band arrangements, or otherwise. Small wires leading from the electrodes conduct the "brain waves" to the electroencephalograph machine, where, by means of vacuum-tube amplification they are greatly magnified and recorded as fluctuating lines on moving paper by a photographic or ink-writing oscillograph.

The electroencephalograms are best obtained when the patient is in a darkened, quiet, electrically shielded cage or room, and when the subject is relaxed mentally and physically, preferably with the eyes closed. Naturally, it is more difficult to obtain the cooperation of small children, and a considerable amount of staking is necessary in many instances. Recently, it has been proposed that sedation with pentothal sodium be used for small children in order

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to obtain electroencephalograms free from movement artefacts.^{5, 6} As the electroencephalogram is being obtained, all movements of the patient must be noted on the record, for bodily movement, opening of the eyes, crying, apprehension, drowsiness, sleep, and many other factors influence the character of the tracings.

The finished record consists of a strip of paper many feet long which is then subjected to analysis. Different methods of analysis are employed, but, in general, they are based on a study of the frequency, amplitude, contour, and rhythm of the waves. The scope of this article does not permit an elaborate exposition of the normal patterns, but the references cited give the interested reader the necessary data.

Leads: Two types of "leads" are employed in electroencephalography. In the "monopolar" leads any one of the several electrodes on the scalp is connected in circuit with a "reference" electrode on the lobe of the ear, so that the electric potentials being amplified and recorded come from the cortex immediately beneath the single electrode. In the "bipolar" leads two electrodes on the scalp are connected in circuit so that the difference in the electric potentials originating from these two areas of the cortex is recorded.

While both types of leads have their value, the "bipolar" leads have special interest in regard to the localization of focal cortical abnormalities, such as scars, abnormal gyri, tumors, and abscesses. Localization of focal cortical abnormalities is achieved by what is known as "phase reversal". A simple explanation is as follows: Let A, B, C, and D represent four electrodes in a straight line across an area of the brain which has a focal cortical abnormality underlying B. When simultaneous tracings are obtained with A and B in one circuit, B and C in another, and C and D in another, a characteristic pattern will be seen. In a typical case, the tracings derived from the A-B "bipolar" lead will be a mirror image or "phase reversal" of the B-C "bipolar" lead, while the C-D "bipolar" lead will not be affected. In other words, when

simultaneous "bipolar" tracings are obtained from a line of electrodes in tandem, as expressed above, the appearance of "phase reversal" indicates an abnormality underlying the electrode which is common to both of the circuits showing the "phase reversal". In the case cited above it is seen that the electrode B takes part in both the A-B and the B-C "bipolar" leads. A similar method of localization called "triangulation" is also used. It, too, is based on phase reversals, and need not be described in detail here.

Jasper² has published instructive diagrams and discussions dealing with localization of focal cortical abnormalities. Gibbs and Gibbs¹ have likewise given a thorough presentation of technics employed in localizing gross lesions of the cortex.

"Monopolar" leads are also useful in localizing cortical lesions. For example,⁴ when a six-channel apparatus is used and the channels are equally matched to record with the same amplitude, the "monopolar" recording will demonstrate any focus of abnormal discharge. Waves of higher or lower voltage and of altered frequency will appear in one lead, or in the leads from one hemisphere. Minor degrees of asymmetry do not signify a cortical lesion. When definite differences exist, confirmation and sharper localization may be secured by recourse to the "bipolar" method.

Some of the most interesting applications of localization have to do with electroencephalograms taken directly from the exposed human brain during operation in order to aid the surgeon in detecting abnormal cortical areas.

Another interesting technic of localization employs a "basal" lead consisting of a sharply pointed wire electrode, insulated except at the tip, which is passed through the nasal meatus and thrust into the periosteum of the sphenoid bone.^{2, 7} This lead is employed to record electric potentials from diencephalic regions of the brain and has been found useful in the localization of lesions in the vicinity of the third ventricle

and with certain types of petit mal epilepsy.²

ARTEFACTS

There are many pitfalls in obtaining satisfactory electroencephalograms. A variety of artefacts which give extraneous patterns not related to cortical activity may be encountered, and must be detected in order to avoid mistaking them for abnormal brain waves. Ogilvie¹ lists them as follows:

1. *Muscle activity.* Electric potentials given off by contracting muscles appear as extremely fast spiky waves. They appear when the subject swallows, or contracts facial muscles.

2. *Sweating.* When the subject perspires, the baseline of the tracings may rise and fall slowly.

3. *Defective application of electrode.* Poor application of ear or scalp electrodes, drying of electrode paste under electrodes, or a defect in the electrode itself may produce artefacts in the tracings.

4. *Movement artefact.* When the subject makes movements such as shifting position, shuffling feet, or when someone walks about in the electroencephalographic cage, or rubber tubing sways, irregular high-voltage waves may appear in the tracing.

5. *Eye Blinking.* Movements of the eyelids cause rhythmically recurring single positive waves most marked in the frontal leads.

6. *Electric appliance artefacts.* The ringing of a telephone in the electroencephalographic room, or an electric fan too close to the patient may cause fast waves in the tracings.

7. *EKG artefact.* The QRS component of the electrocardiogram is occasionally superimposed on the electroencephalographic tracing. This is observed most often when the subject has hypertension, or when the tracing is taken with the subject lying on a rubber-tired litter such as is often used in hospitals.

8. *Sixty-cycle alternating current.* Sixty-cycle alternating current arising from neighboring electrical circuits in the building may be "picked up" by the electroen-

cephalograph and show up on the tracings as extremely fast spikes.

9. *Condenser discharges.* Single sharp spikes in the tracings may occur at random from the abnormal discharge of a condenser in the amplifying unit.

From what has been said in this very brief review of the technic of electroencephalography, it is apparent that the procedure is highly specialized but that the difficulties are surmountable, and that the information to be derived can be extremely worthwhile.

NORMAL PATTERNS AT VARIOUS AGES

Of fundamental significance in the interpretation of abnormal electroencephalograms at various ages in childhood has been the establishment of normal patterns. While there has not been complete agreement as to the normal brain waves of very young infants it has been generally conceded that the electroencephalographic patterns of children differ decidedly from those of adults. The younger the child the greater the difference.

Smith⁸⁻¹³ and Lindsley¹⁴⁻¹⁶ have made outstanding contributions to the study of normal electroencephalograms in the various age groups of childhood. The reader is referred to their writings for greater detail, as well as to the publications of others.^{1, 17-19}

Newborn Period. In the Pediatric Department of the University of Tennessee we have focused our effort on the study of the brain waves of newborn infants.²⁰⁻²³ The work has taken three trends: (1) the study of the brain waves of normal fullterm newborn infants in various stages of consciousness varying from wide-awake, through drowsiness to sleep; (2) the study of the electroencephalographic patterns of newborn infants born of mothers sedated with seconal; and (3) the study of newborn infants showing clinical neurologic abnormality.

The central purpose of the work in our department has been to utilize electroencephalography in the study of certain factors in labor and delivery which influence the cerebral activity of the newborn baby. The critical episode of being born is a ma-

for physiologic adventure, the seriousness of which is attested by the fact that deaths within the first forty-eight hours account for a very high portion of the total infant mortality. Any data which would tend to elucidate mechanisms operative in labor and delivery which have a deleterious effect on the brains of babies should prove of value in the effort to reduce neonatal mortality.

Our findings as to the electroencephalographic patterns of normal full-term newborn infants have been based on 202 electroencephalograms obtained on 138 babies ranging in age from 20 minutes to 6 days. The electroencephalograms obtained have been studied from three particular viewpoints: (1) the ages of the infants; (2) the respective leads employed; and (3) the types of sedation, analgesia, or anesthesia given to the mothers during labor and delivery. The cases have been divided into five groups: (1) infants whose mothers received no sedative, analgesic, or anesthetic drug; (2) infants whose mothers were given caudal analgesia, where it is assumed that no depressant drug reached the fetal circulation; (3) infants whose mothers received a barbiturate drug (seconal); (4) infants whose mothers were given spinal anesthesia; and (5) infants whose mothers received miscellaneous drugs not mentioned above.

All of the tracings were taken immediately after feedings, with the infant in a nurse's arms in an electrically shielded cage. More than 100 consecutive blood sugar determinations immediately after electroencephalography were normal, indicating that hypoglycemia did not influence these tracings. Likewise, blood calcium determinations were consistently normal. With the exception of 25 infants studied while awake and drowsy, all of the tracings were taken with the infants fast asleep. A run of twenty minutes was obtained.

In general, it may be said that the electroencephalograms of newborn babies are characterized by considerable irregularities of the tracings and a lack of sustained consistent rhythm such as is seen in older children and adults. From the standpoint of

cortical electrical activity, the marked dysrhythmia of the tracings gives evidence of a lack of functional organization. The baby's brain waves are as immature as the baby himself.

While our findings agree in part with those of Smith,⁸⁻¹³ and Lindsley¹⁴⁻¹⁶ there are certain differences which need not be brought out in an article of this scope, but which are discussed in the original papers.²⁰⁻²³

Of interest is the fact that the electroencephalograms of infants born of mothers given caudal analgesia were practically identical with the tracings from infants born of mothers given no analgesia or anesthesia whatsoever. This is confirmatory evidence of the clinical observation that "caudal" babies appear to be more alert at birth.²⁴

Of particular interest is the fact that in 51 electroencephalograms obtained on 20 newborn infants born of mothers given seconal sedation there was marked alteration of the normal pattern. In comparison to electroencephalographic patterns previously found to be characteristic of normal fullterm sleeping infants, the brain waves of these babies showed a striking electrical cortical depression characterized by a marked decrease in slow waves of moderate amplitude, and some increase in fast waves of low amplitude. These effects persist into the third day, although the baby may have become clinically alert.

It is apparent how this method of study could be applied to evaluating dosages of various sedative and analgesic agents given to the mother in regard to their effects on the baby's brain waves, and on his clinical behavior from the standpoint of alertness or drowsiness. Many different agents need evaluation, both in regard to total dosage administered during labor and in timing of doses prior to delivery. Extensive physiologic studies of the mother during labor and delivery need to be done in order to detect factors other than drugs which may be influencing the baby's brain waves. Such studies are under way, but have not reached the point where conclusions can be drawn.

We have been particularly interested in a group of newborn infants who have had grossly abnormal electroencephalograms which have been correlated with neurologic abnormalities. In some cases the electroencephalograms demonstrated cortical electrical abnormality before clinical symptoms and signs emerged, and electroencephalographic abnormalities persisted in some of the infants after neurologic symptoms had disappeared.

Of equal interest are a few newborn infants, detected in routine studies, who had abnormal electroencephalograms without clinically apparent abnormalities. The significance of these observations awaits prolonged follow-up and larger series of such cases.

Growth of the "Alpha" Rhythm. In the normal adult the brain waves which have probably received the most study are the so-called "alpha" waves. These waves are usually in the neighborhood of 50 microvolts amplitude and occur in frequencies which range from 8 to 13 per second. In the study of normal children of various ages the development of the "alpha rhythm" has also received considerable attention. Smith and Lindsley have both shown that in infants awake the occipital alpha rhythm usually first appears by the third or fourth month, at a frequency of 3 to 4 per second. Once established, the frequency of the waves increases with age, rapidly during the first year but more slowly thereafter until a relatively stabilized adult level is attained, usually sometime before the end of the twelfth year. Interestingly enough, the growth curve of alpha wave frequency and age follows essentially the same pattern as does brain weight in children. It is believed that the initial appearance of occipital alpha rhythm is associated with the initial functioning of the visual cortex, since it appears when the child begins to perceive objects and follow them across the visual field.

Other Characteristics of Brain Waves of Children. While the scope of this presentation does not permit a full account of other characteristics which differentiate electro-

encephalograms of children from those of adults, a few additional points deserve comment. Gibbs and Gibbs¹ state that by the ninth year the record from occipital areas looks essentially like that in an adult, but that frontal and parietal areas still show at nine years of age much slower activity than is seen in a normal adult. They state further that at nineteen years of age all normal individuals show adult types of tracing from all cortical areas.

Lindsley has shown that the normal diminution or obliteration of the alpha waves of the occipital area which occurs with visual, auditory, or tactile stimulation takes place with an increasingly shortened interval between stimulus and brain wave alteration as age advances. It is as if the brain becomes more alert and responsive as the child grows older.

Brill and Seidemmann²⁵ have shown that the dysrhythmia which is frequently seen in spontaneous resting records of epileptics can often be produced by having the patient hyperventilate. While hyperventilation elicited dysrhythmias in 84 per cent of patients with idiopathic epilepsy, normal adults did not show dysrhythmia following hyperventilation. On the other hand, Brill and Seidemmann²⁶ found that many normal children may develop a dysrhythmia during hyperventilation which appears identical to that seen in patients with epilepsy. They found that this was common in younger children and that as the child grew older this tendency became less frequent. They thought that this epileptic-like dysrhythmia associated with hyperventilation might be indicative of a low convulsive threshold, and was in accord with the well-recognized greater tendency for young children to develop seizures during acute illnesses.

EFFECTS OF VARIOUS STIMULI ON THE PATTERN OF BRAIN WAVES

It has been mentioned previously that reliable electroencephalograms are best obtained when the individual is in a darkened, quiet, electrically shielded room, and when the subject is mentally and physically relaxed, preferably with the eyes closed. The basis for this statement rests on the fact

that visual, auditory, and tactile stimuli tend to diminish or obliterate the normal rhythms found in the well-relaxed subject. For example, when a normal individual has his eyes closed the alpha rhythm of waves at a frequency of 8 to 13 per second and with an amplitude of approximately 50 microvolts is suddenly changed by opening of the eyes to a much flatter type of tracing with lower amplitude and faster activity. Similarly, when the subject is in a darkened room with the eyes open, the normal alpha rhythm can be arrested suddenly by a flash of light. Auditory, tactile, and pain stimuli also effect considerable changes in the waves. Gustatory stimuli also influence the tracings.

Answering questions involving mental effort blocks the alpha rhythm and otherwise modifies the electroencephalogram.

Fright, fear, anxiety, apprehension, and embarrassment may influence the tracings. Jost²⁷ and Sherman and Jost²⁸ studied the influence of frustration on the electroencephalogram and found that it produced alterations in the tracings which were more noticeable in unstable individuals.

Various other applications of electroencephalography to psychologic states have been made. In brief, they all tend to show that anything which upsets the even tenor of the way also alters the brain waves.

The effects of a reduction in oxygen saturation on the electroencephalogram have also been studied. It is generally conceded that no great changes are produced until unconsciousness occurs, and then so-called delta waves predominate.

Several investigators have shown that reduction of the blood sugar level below a critical limit will produce coma and unconsciousness, but before this state is reached there is a slowing of the alpha rhythm and certain other changes in the electroencephalogram. High blood sugar levels tend to produce higher frequencies of the brain waves.

The electrical activity of the cortex speeds up with acidosis and slows down with alkalosis. Fever increases the fre-

quency of the alpha waves, probably by increasing the metabolic activity of the nerve cells. Artificial elevation of metabolism by means of thyroid extract increases the frequency of alpha waves. Space does not permit a consideration of the effects on the electroencephalogram of the many drugs which have been studied.

From what has been said concerning the effects of certain psychologic states and stimuli on the electroencephalogram, it is clear that cortical electrical activity is extremely sensitive to a wide variety of influences. This is not surprising, in view of the fact that all our environmental contacts have some effect on our central nervous system. The importance of having some idea of the multiplicity of factors which may influence brain waves lies in the fact that they must be taken into consideration in making and interpreting tracings.

ELECTROENCEPHALOGRAPHY IN EPILEPSY

Probably the most generally known fact about electroencephalography is that it is extremely useful in the diagnosis of epilepsy. In epileptic seizures of all sorts there is a paroxysmal cerebral dysrhythmia which often gives characteristic patterns in the electroencephalogram.

Persons with epilepsy have abnormal electroencephalograms not only during seizures but also between attacks, so that tracings facilitate diagnosis in a seizure-free state as well as during an attack. The fact that hyperventilation tends to elicit abnormal brain waves in epileptic individuals has already been discussed.

There is no point in giving here the details of the differences in classification of the brain waves of epileptics. Suffice it to say that two chief schools of thought exist: that of Gibbs and Gibbs¹ and that of Jasper.²

The Gibbs classification, although recognizing additional variations, gives four general types of seizure patterns: (1) grand mal attacks are associated with a burst of increasingly fast waves of higher and higher amplitude in the tonic phase which changes to slower waves as the clonic phase begins; (2) petit mal attacks are characterized by a "spike-and-dome" or "spike-and-

wave" complex occurring usually at a rate of three per second; (3) petit mal variant attacks have the spike-and-dome, but it occurs at a rate of about two per second; (4) psychomotor or psychic equivalent attacks, consisting of apparently conscious acts of impulsive, uncontrolled character, are accompanied by high square-topped waves occurring at a rate of three to six per second. Jasper has emphasized two abnormal features of the electroencephalograms of epileptics: (1) hypersynchrony, or abnormal voltage, and (2) dysrhythmia, or abnormal frequency. According to this classification, localization or distribution of the disturbance provides the most satisfactory basis for classifying the electroencephalograms of epileptics. Three principal types of disturbance are described: (1) localized unilateral, (2) bilaterally synchronized, and (3) diffuse. Jasper also classifies tracings as to whether disturbances occur as random findings or in paroxysmal rhythmic sequences. Stress is also laid on the forms of the waves and their frequencies.

A tremendous amount of work has been done on electroencephalography in epilepsy. Not only have these efforts been directed at finding patterns characteristic of various clinical types, but many investigations have been made to determine the underlying faulty mechanisms which give rise to seizures. Localization of the focus in the cortex from which the paroxysmal dysrhythmia originates has received special attention, for surgical excision of such a focus has been carried out many times with brilliant success. Excision does not always cure, however. Furthermore, not all cases of epilepsy have localizable foci, since many cases appear to be due to diffuse disturbances, and some of subcortical defects, possibly to defective thalamic control of the cortex.

The electroencephalogram has also been useful in following the course of patients given anticonvulsant drugs. The character of the tracing gives evidence of the effectiveness of the medication in controlling cerebral dysrhythmia. Furthermore, since

electroencephalograms may detect certain brain wave patterns characteristic of epilepsy in the absence of clinical attacks, it is possible to give medication to prevent seizures in persons who would otherwise not have the benefit of such therapy.

One of the most interesting applications of electroencephalography in the field of epilepsy has been in establishing the fact that close relatives of patients with idiopathic epilepsy often have cerebral dysrhythmia without clinical attacks. This evidence corroborates a hereditary background for certain cases of epilepsy.

LOCALIZATION OF FOCAL CORTICAL ABNORMALITIES

The electroencephalogram is of great usefulness in localization of gross lesions of the brain which are either in the cortex or close enough to the surface to interfere with function of the cortex. "Monopolar" or "bipolar" leads may be employed, as has been discussed in the brief description of the technic of electroencephalography.

In patients with epilepsy, the electroencephalogram is of definite value in selecting cases which are due to focal cortical abnormality and in helping to localize for the surgeon the area in which cerebral dysrhythmia originates. In localization of such focal areas, electroencephalography is only one of several steps taken to find the site of the lesion. The other procedures employed are a detailed history of the patient and the pattern of his seizure, careful neurological examination, and pneumoencephalography. It should be stressed that modern approach to convulsive disorders involves a careful search for a focal lesion, in the hope that it may be of a type that can be removed. Excellent results have followed removal of scars, abnormal gyri, and other lesions. However, it is important to realize that excision of the focus does not invariably result in permanent cure, for some of the cases have a return of seizures and of abnormal brain waves from the area adjacent to that operated upon. All patients thought to have epilepsy should have detailed studies including electroencephalography, for it is a great tragedy to con-

tinue indefinitely with medical management alone in those cases where surgical excision may offer so much.

Other brain lesions may also be localized by electroencephalography if they are in the cortex or interfere with its function. Such lesions include tumors or abscesses of the brain, subdural and epidural hemorrhage, areas of trauma, and other less common conditions. Here, again, electroencephalography has a dual role of proving the presence of cerebral abnormality and helping to localize it. Obviously, the exact nature of the lesion cannot be determined by the procedure.

RELATIONSHIP OF THE ELECTROENCEPHALOGRAM TO PERSONALITY

Some of the most interesting electroencephalographic data have to do with the relationship of the pattern of the brain waves to various types of psychiatric and psychologic disorders. Lindsley³ has summarized the information from a wide variety of sources. He states that although numerous studies have been made of psychiatric disorders, especially the classical psychoses, no distinctive abnormality of the electroencephalogram has been found which could be said to be pathognomonic of a particular type of disorder.

Of special interest in the field of pediatrics is the work with behavior problem children. In brief, a number of investigators have found disturbances of cortical function, as expressed in abnormal electroencephalograms, in 70 to 90 per cent of the cases. Brill²⁹ has reviewed the subject.

Jasper, Solomon and Bradley³⁰ studied 71 children between the ages of 2 and 16 years, admitted to the Emma Pendleton Bradley Home with a primary diagnosis of behavior problem. Half of these children had a history or physical signs of nervous system involvement, while half did not. Forty-two of these 71 children, or 59 per cent of the entire group, had abnormal electroencephalograms. Of the children with a history of nervous system disease or defect, 74 per cent showed abnormal electroencephalograms. Of great interest was the fact that the group with the normal electroencephalograms

responded much better to treatment and guidance, while those with especially abnormal electroencephalograms were particularly refractory. Jasper and his co-workers concluded that abnormal brain function, as revealed by the electroencephalogram, was an important etiologic component in the majority of a group of behavior problem children whose disorder had previously been considered primarily psychogenic.

Cutts and Jasper³¹ studied the effects of benzedrine sulfate and phenobarbital on 12 problem children with abnormal electroencephalograms. Benzedrine did not appear to influence the brain waves, but clinical improvement occurred with benzedrine medication in 7 of the 12 cases. Phenobarbital made some of the electrograms more abnormal and improved others. It seemed to cause exacerbation of clinical symptoms in the majority of the children.

Strauss, Rahm and Barrera³² found that 68 per cent of 44 children with severe behavior problems had abnormal electroencephalograms.

Lindsley and Cutts³³ demonstrated that the electroencephalograms of behavior children differed significantly from those of normal children. Interestingly enough, they found the behavior problem group unusually sensitive to hyperventilation as expressed in outbursts of high amplitude 3 per second waves. Three things which differentiated the behavior problem group from the normal group were that the former had a greater incidence of 2 to 5 per second waves, 5 to 8 per second waves, and showed a greater tendency to the "hyperventilation" effect.

Brill, Seidemann, Montague, and Balser³⁴ found abnormal electroencephalograms in 61 per cent of a group of 28 behavior problem children. The percentage of abnormal tracings was much higher in the children with organic brain disease or epilepsy, or neurotic or psychotic manifestation.

It is well to remember that all of the studies cited have dealt with serious types of behavior abnormalities which lead children to juvenile courts, children's institu-

tions, and to other agencies which deal with such protracted problems of child behavior. There is no evidence that most simple, common behavior problems which are so much a part of every child's life are based on any cortical abnormalities.

One may readily see the importance and the implications of the studies which have been mentioned. It is necessary to reorientate ourselves toward children with serious behavior disorders. In spite of the importance which must always be attached to general health, environment, and psychogenic factors, it becomes necessary to realize that behavior problems may have serious underlying organic causes. It is an injustice to the child and to his parents to assume in every case of serious proportions that there has been faulty management. What goes on in the child's brain may be more important than what goes on in his environment.

SUMMARY AND CONCLUSIONS

Electroencephalography has had wide application in the field of pediatrics. Five special fields of interest have been: (1) establishment of normal patterns for various age groups; (2) determination of the effects on brain waves of various stimuli and psychologic states; (3) study of cerebral electrical dysrhythmias associated with epilepsy; (4) localization of focal cortical abnormalities; and (5) relationship of electroencephalographic pattern to personality, with special reference to studies in a number of serious behavior problems.

Electroencephalography is one of the major procedures in establishing a diagnosis of epilepsy; it not only aids in determining type of cerebral dysrhythmia, but also differentiates localized cortical abnormalities from generalized defects, and thereby paves the way for possible surgical removal. No epileptic patient should be treated by medical management alone without first exploring the possibility that there is a sharply localized epileptogenic focus susceptible to excision. Surgery does not invariably cure, but brilliant results have been achieved in many instances. Other types of cerebral lesions, such as tumors,

abscesses, subdural and epidural hemorrhage, and areas of trauma may be localized by the procedure.

Of great significance is the fact that many children with serious, protracted behavior disturbances have abnormal electroencephalograms.

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POSTGRADUATE EDUCATION IN PEDIATRICS FOR GENERAL PRACTITIONERS

SIDNEY S. CHIPMAN, M. D.*

NEW ORLEANS

Postgraduate medical education is used in this discussion as a term to describe any type of systematic supervised educational activity, formal or informal, that helps the physician to keep abreast of developments in his own field or fields of practice. To be noted especially is the latter portion of this definition, which emphasizes the function aimed at keeping a physician up-to-

date in his own field and not at training for a specialty.

New knowledge and developments in medicine occur so rapidly that if a physician is to remain well informed and professionally competent he must seek and take advantage of all possible educational opportunities. All too frequently the busy rural practitioner's only opportunity to learn of new developments is a few hurried minutes with the detail men from the pharmaceutical houses or a very hasty glance at the literature left in the office by these individuals. These pamphlets usually describe in glowing terms the almost certain brilliant results which must follow the use of a new drug, and neglect, intentionally or otherwise, to mention failures or dangers inherent in its use.

The distribution of physicians, as purveyors of medical services, has been a subject of considerable study and discussion in recent years. The current agitation and trend towards radical changes in medical practice probably stem from the fact that medical service is inadequate both in distribution and quality.

The American Academy of Pediatrics has conducted a comprehensive survey of many phases of the medical care of children in the United States. The results of this survey have been published and are available for general study and use.* From this and other surveys, certain general statements can be made regarding medical care received by the children in our country.

1. Seventy-five per cent of the medical care of the children in the U. S. A. is provided by general practitioners.

2. Forty-six per cent of general practitioners have minimal or no hospital training in pediatrics.

3. There is tremendous variation in the amount of medical care rendered to children in various parts of the country.

4. Children in rural areas receive less care, due to the shortage of well trained physicians in these areas.

The results of the Academy study give concrete evidence of the unequal distribu-

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tion of medical care of children. However, they supply much less information concerning the quality of medical care. It is with the improvement of quality of care that postgraduate education is concerned. It is highly unlikely that the number of pediatricians will be so greatly increased that they will render more than a small proportion of the total care of children. Thus the family practitioner probably will remain as the largest dispenser of medical care of children and it is primarily with this group that we are concerned.

Postgraduate medical education was started in a small way in this country in the latter part of the last century. Initially it was the idea and responsibility of organized medicine only but since that time medical schools and state departments of health have recognized the need and have assumed active responsibility in program planning. Michigan, Minnesota, Pennsylvania, North Carolina, and Tennessee early established formal programs. During the past twenty years some type of organized program has been established in nearly all regions of the country. Inevitably this development has resulted in a wide variety, both in the scope and type of program. Michigan has developed intramural three to six day programs and extramural courses of one day a week for eight weeks. Minnesota has concentrated its efforts in continuation study on the university campus. Tennessee, North Carolina, and Oklahoma have developed the "circuit" type of instruction in which an instructor or group of instructors makes a fairly complete coverage of at least the rural areas. Texas and other states have emphasized postgraduate medical assemblies. Maryland has relied on personal visits with physicians and a limited number of organized meetings. Undoubtedly, programs should vary with local conditions.

In general, extramural courses, or the carrying of the program to the physicians, have been more satisfactory than intramural courses. Clinics and round table discussions are more valuable than didactic lectures. All programs must have two ob-

jectives, namely, refresher work in subjects previously studied in medical school or hospital, and dissemination of information concerning newer knowledge and techniques. Intelligent planning and above all vigorous active support and participation of the physicians are essential to success. This second requirement is by all odds the most difficult.

Postgraduate education in Louisiana has not been developed to a degree which we could consider adequate. Intramural courses have been established and conducted successfully at Tulane. Extramural teaching has been entirely ignored save for two three day sessions conducted by Louisiana State University a few years ago. Within the past year Louisiana State University with the financial support of the Louisiana State Department of Health has added to its pediatric staff a member whose major responsibility is the establishment of a program or programs directed at continuing the education of the family physicians of Louisiana. A similar effort has been initiated in Mississippi by Tulane and the Mississippi State Department of Health. It is our pediatric effort in Louisiana that I wish to discuss further.

During a brief survey of the state last July and August an effort was made to estimate the location of the greatest need for further pediatric education. It was also felt desirable to present such a trial program in an area in which the most active support of physicians could be relied upon. After considering local need, local interest and available time and personnel we felt that the pediatric department at Louisiana State University should try the following programs during this academic year:

1. A series of three conferences to be held in the Fifth Congressional District. It was planned that a team consisting of three members of the faculty of the medical school should spend four days in November, January and March in selected key towns of this district. During each visit, under the auspices of the regional or parish medical society, evening meetings would be held in the four towns selected. Afternoons

would be devoted to informal discussion and office consultations. The subjects chosen were (1) diseases of the respiratory tract, (2) diseases of the gastro-intestinal tract and (3) contagious diseases and immunizations. The location of this district and its subdivisions is shown on the accompanying map. The numerical response of the physicians to this program is shown in tables I and II.

TABLE I CONFERENCES IN PEDIATRICS FIFTH CONGRESSIONAL DISTRICT 1947-48 ATTENDANCE OF PHYSICIANS		
Location of Meeting	Physicians in Area	Average Number of Physicians Attending
Tallulah	24	6
Bastrop	11	10
Ruston	43	17
Monroe	124	38
Total	202	71 (35%)

TABLE II					
	Location	Physicians	Attendance		
		In Area	Nov.	Jan.	Mar.
Tallulah	East Carroll	5	....	1	....
	West Carroll	7	....	1	....
	—Madison	8	5	5	4
	Tensas	4	1	2	1
	Total	24	6	9	5
Bastrop	—Morehouse	11	14	10	7
Ruston	Union	12	1	....	....
	—Lincoln	20	16	15	12
	Jackson	11	2	2	2
	Total	43	19	17	14
Monroe	—Ouachita	77	33	35	38
	Caldwell	5	1	1	1
	Richland	16	1	1	1
	Franklin	16	....	1	....
	Concordia	6	....	....	....
	Catahoula	4	....	....	....
	Total	124	35	38	40

The average attendance of physicians at these conferences represented 35 per cent of all available physicians in the district. It is evident also (table II) that we were successful in attracting chiefly those physicians located in the parish in which the meeting was held and that we failed in obtaining a good turn-out from the area as a whole. Thus some other method must be devised to reach physicians in the most sparsely populated areas.

2. A more complete refresher course in

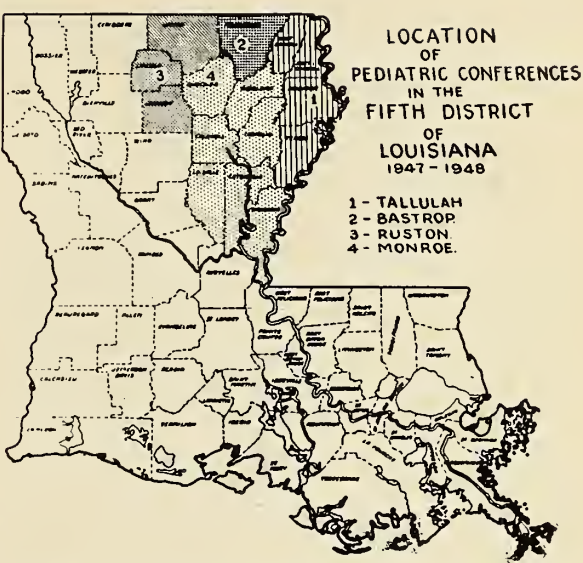


Fig. 1: Location of pediatric conferences in the Fifth District of Louisiana 1947-1948.

pEDIATRICS to be presented to the physicians of Tangipahoa parish. A program embracing ten important phases of pEDIATRICS and totaling some 20-25 hours is under way. Individuals well versed in particular subjects, and associated with other departments of the Medical School, assisted with portions of this program. However, the director was present and in charge of all these meetings. The program and the attendance figures for the first half of the course are shown below. This phase of our trial program has been very well received. Interest and discussion have remained at a high level.

PEDIATRIC REFRESHER COURSE (25 Hours) TANGIPAHOA PARISH MEDICAL SOCIETY January - May, 1948		
January	8	Croup and other Diseases of the Respiratory Tract
January	29	Care of the Premature Infant
February	12	Diarrhea in Infancy and Childhood
February	26	Helminthiasis
March	11	Uses of the Sulfonamides, Penicillin and Streptomycin
		Demonstration of Use of Scalp Veins in Intravenous Therapy
March	25	Common Contagious Diseases
		Immunizations
April	8	Rickets and Scurvy
		Other Deficiency Diseases
April	22	Role of Nutrition in Pregnancy
		Infant Feeding

May	13	Surgical Diseases in Infancy and Childhood
May	27	Tuberculosis in Infancy Tuberculosis in Adolescents

Attendance (first half)

Physicians registered in parish—29

Average attendance per session—15 (50%)

3. A five day intramural refresher course in pediatrics was conducted at the University in April 1948 with registration limited to 30 family practitioners from less densely populated areas of the state. Judging from the comments of the physicians in attendance and those participating in the program it was most successful. We feel that a program of five days' duration is the optimum to attract and maintain the interest of these busy practitioners. The geographical distribution of the physicians attending this course is shown on the accompanying map. It is perhaps worthy of comment that approximately twice as many applications were received as could be accepted.

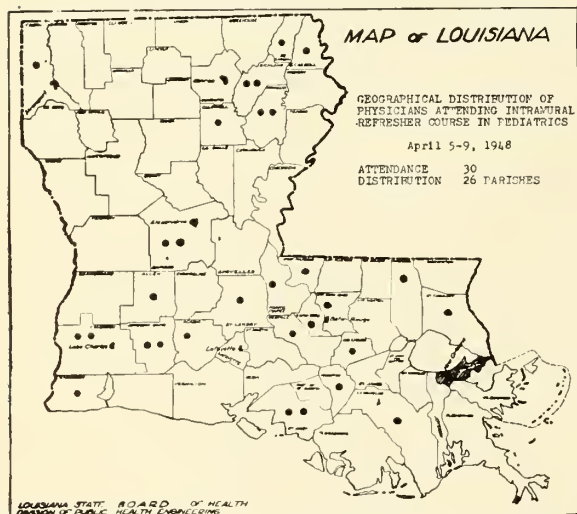


Fig. 2: Geographical distribution of physicians attending intramural refresher course in pediatrics. April 5-9, 1948

Distribution 24 parishes
Attendance 30

It is realized that only a very small proportion of the general practitioners of the state have been reached this year but a certain amount of valuable experience has been gained. Many problems have been presented and probably some will plague us always. We have no delusions that these

types of programs are necessarily most suited to this state. More comprehensive concentrated extramural courses, embracing round table discussions and clinical teaching, would certainly be more desirable but to date it has seemed impossible to arrange them. Lack of interest and vigorous support on the part of some physicians remains a serious problem.

It will always be difficult to estimate the success of any program. Too much emphasis should not be placed solely on the number of physicians in attendance, but rather on whether or not we have succeeded in:

A. Making physicians conscious of the breadth and rapidity of medical advances and increasing their desire to keep abreast of these changes.

B. Stimulating physicians to use sound new methods and technics in the study and care of their patients.

C. Helping physicians to realize that an improved quality of service to their patients brings to the physician an increased measure of personal satisfaction.

D. Developing a sense of critical evaluation of methods or results of a particular type of therapy.

In conclusion, I think it is fair to say that a continuation or postgraduate program is the direct responsibility of the Medical School and the State Department of Health, that the type and content of such a program must vary with local conditions, and that to date our trial effort in Louisiana has been encouraging.

ADVANTAGES OF EARLY RECOGNITION AND TREATMENT OF ALLERGIC DISORDERS IN INFANCY AND CHILDHOOD*

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A decade or two ago it was uncommon to hear papers on allergic problems of childhood. The situation has now changed. Many pediatricians who were most skeptical of allergy have now been convinced of

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its frequency and importance. No phase of allergy gives more gratifying results when properly managed, than that occurring in children.

Immunization or prevention constitutes a large part of pediatric practice. The axiom "An ounce of prevention is worth a pound of cure" is certainly applicable in allergic problems of childhood. The sooner they are recognized and proper therapy instituted, the better the results.

The pathology of pediatric allergy is different from that of adults in that it is frequently reversible among children, whereas in adults such is not the case. An additional important factor in the care of children with allergic problems is their great co-operation.

Our first problem in caring for pediatric allergic disorders is their early recognition. We, as pediatricians, see incipient allergy or allergic-like trends before they are in full-bloom, and often long before they are referred to allergists, who unfortunately are almost entirely internists and not pediatricians.

The earliest allergic-like signal, I believe, and have so reported, is fetal hiccoughs.¹ While it is far from common, I do not feel that it is rare.² There is a hiccough-like spasm in the abdomen of the pregnant mother which can be felt and heard by auscultation, and yet the mother is not hiccoughing. The sound is in no way easily confused with uterine soufflé, fetal movements, or heartbeats. It occurs in the latter half of pregnancy at irregular times, appearing every few seconds for a period of minutes. Among 21 cases reported by me in 1942 it was possible to reproduce the hiccoughs more or less at will, in 5 cases, by repeatedly giving to the mother the same offending food.

After birth, those babies were generally very difficult feeders, half of the number being unable to tolerate any type of milk, plain or modified. By ten years of age all were suffering from some form of easily recognized clinical allergy.

Mothers in whom this phenomenon occurs should probably avoid food cravings

and all foods, including milk, to which they are previously known to be clinically sensitive, as allergic symptoms during pregnancy may either abate or flare up. Where milk is prohibited, calcium should of course be added to the mother's diet.

Fetal hiccoughs suggest active sensitization similar to the Rh antigen-antibody reaction. The obstetrician should carefully search for offending foods in the mother's diet and should suggest to the pediatrician the possibility that the baby will be a difficult feeder or allergic.

The boiling of milk for infants' formulas has done much to lessen milk sensitivity, as heat denatures lactalbumin, the main offending protein. In spite of this, we see far too many infants with untoward symptoms who are getting nothing but milk.³ Those children are, in the main, markedly sensitive to the lactalbumin or casein of the milk. The symptoms suggestive of such are recurrent or persistent vomiting, diarrhea, constipation, abdominal pain or colic, nasal blockage or discharge, rattling sounds in the throat, croup, papular or eczematous skin rashes, perianal irritation and mucus in stools. Persistence of such deleterious signs or symptoms in spite of proper mechanics of nursing, adequate formulas, change of sugar, etc., should suggest a change to another modified milk formula. If there is no improvement, substitution of another animal's milk, such as goat's milk, is in order as the lactalbumin is different in all animal milks. In a few days, if there is still no improvement, we are probably dealing with clinical casein sensitivity, as the casein is alike in all animals' milk. Next, a vegetable milk, as Mull-Soy, is indicated and, if such is of no value, an amino-acid-type of formula should be tried. In a few cases nothing seems to work to advantage, and we either have to alternate between the least offending formulas or try at an early age to feed strained meats as the main source of protein, and use other solid foods to balance the diet.

In rare instances breast milk may disagree. Here, however, the disturbances, resulting from breast milk are possibly

due to sensitivity to some specific food the mother ingests, rather than breast milk *per se*. Even minute amounts in the mother's milk will produce symptoms when a particular food is consumed by the mother.

Too early introduction of vitamins and food may cause untoward symptoms. A larger factor is the more or less routine use of multiple vitamins and foods. If reactions do occur, it is impossible to know which substance offends, whereas in single vitamins or foods detection is easier.

When first giving a new food substance, if we wait first for five days before giving it a second time, we can generally discover those foods which disagree.¹ Food dislikes and disagreements do not always parallel each other. Foods *persistently* disliked had best be avoided for three to six months. Those which disagree should be withheld for another two or three months, as tolerance develops rapidly in infants and young children.

Immunological measures begun early in life give rise to less discomfort and reduce the subsequent need for serums, such as tetanus antitoxin.

Allergic-like symptoms beginning in infancy usually subside or become latent from six to eighteen months. Then others recur around three or four years of age but often in a different form. For instance, colic of early infancy often "returns" as recurrent head colds or sinus disease; croup often as bronchitis or asthma; eczema as asthma; recurrent vomiting or digestive upsets as abdominal pain, headaches or colitis. In addition, young children will often become rebellious or antisocial or non-cooperative when a latent previous allergy has become manifest. If such personality changes continue uncorrected, the child may become a candidate for psychiatric care.

The development of allergic symptoms after a year or so of age usually necessitates laboratory aids and skin tests for diagnosis and care of the allergic disorder. A detailed history is necessary in addition to the routine pediatric one. Physical examination, x-rays, blood counts, urinalysis, and

nasal smears may also prove to be of value.

The chronic or recurrent signs or symptoms highly suggestive of allergy are as follows:

In the respiratory tract: Frequent "colds", sneezing, coughing, wheezing, croup, nasal itching or blockage, sniffing, clearing of the throat, twitching of nostrils, unilateral atelectasis and sinus infection.

In the gastro-intestinal tract: Repeated attacks of "colic", vomiting, belching, hiccoughs, "bilious spells", abdominal pain, car sickness, excessive crying or discomfort, constipation, multiple stools, mucus in stools, irritable colon or colitis.

In skin and mucous membrane: Eczema, "hives", angioneurotic edema, discolorations beneath eyes, pallor of lips, cold sweats, fever blisters, oral ulcers, itching with or without a rash, swelling beneath outer portion of lower eyelids, and anal excoriations.

In the neurological system: Repeated headaches, unexplained fatigue, excessive irritability, shortening of span of attention, dizziness, restlessness during sleep, frequent drowsiness, rarely convulsions and epileptiform seizures.

A definite history of allergic disorders in the family enhances the likelihood of such a diagnosis for the child under consideration. The more allergic the parents, the sooner allergic symptoms are apt to appear in the child.

Physical findings suggestive of underlying allergy are wheezing, sneezing, nasal rubbing or sniffing or hawking, urticaria or constant itching of any part of the body, cobblestone-like swellings in the eyelids or pharynx, hacking cough, pale and boggy turbinates, pallor of lips with circumoral sweating, subocular pinkish or purplish discoloration, prominent nose due to lack of proper development of the sinuses in early life, irritability, shortening of span of attention.

Unfortunately, children are too often subjected to the removal of tonsils and adenoids for recurrent colds or bronchitis and not for infection of tonsils or adenoids *per se*. Such procedure is devoid of success.

When, however, removal of the tonsils and adenoids is indicated in an allergic child, that operation had best be undertaken in the season when pollens are not prevalent. Such a time reduces the danger of a pollen hay fever or asthma which not infrequently follows within a year or two.

In order to carry out an adequate number of skin tests, it is necessary to have a child make many office visits and subject him to much punishment. Such a procedure often terrorizes any child and demoralizes him for months or years. To prevent such an unfortunate ordeal, the passive transfer method, or "testing by proxy", offers the ideal solution for children under seven or eight years of age.⁵ The ultimate information obtained is as valuable as that secured from both direct scratch and intracutaneous tests. For those having eczema, skin rashes, recurrent urticaria, or angioneurotic edema and dermatographia, the indirect method is the better one, as the skin in these conditions is unsuited for proper testing. It must be remembered that the history reveals sensitivity, whereas positive skin tests suggest past, present, or future clues.

The indirect method of testing makes an adequate allergic study available in any remote area and saves the expenses of the child and mother incurred in traveling to some distant point and spending many days there being tested. The local physician simply sends the defibrinated sterile blood serum by ordinary mail to the allergist doing the study for him. Of course, the blood must be from a Wassermann negative child. The referring physician, of course, sends to the allergist a summary of the child's history, physical examination, laboratory findings and clinical course. Final detailed directions are then forwarded to the physician caring for the allergic child. An antigen, if indicated, is sent with specific directions as to dosage.

At the end of six to twelve months, previously forbidden foods are carefully reintroduced at intervals of five days. When symptoms or signs occur within these five

days, that food is avoided again for six more months before another trial. If no symptoms result after the first retrial, it is wise to allow that food one or twice per week. Then after four months, if still free of untoward symptoms, more frequent use may be tried.

Where food is restricted, care must be taken to furnish sufficient calories, minerals and non-offending sources of vitamins.

Antigens are given every three or four days until the tolerance dose is found; then the interval between injections is gradually increased until a three-week schedule is reached. This three-week schedule is maintained for about eight times; then it is usually possible to stop the antigen except when pollens are real factors. In such instances, the injections are speeded up to once per week during the pollen season and once every three weeks between pollen seasons for at least three successful, successive years. During pollen seasons one must also avoid the main offending foods and include in the antigen inhalant extracts, in addition to the pollen extracts.

Antigens are of great value in respiratory types of allergy, but in mixed types of respiratory and skin allergy they will often cause exacerbation of skin lesions. Where both types of allergy exist, it is perhaps wise to maintain only dietary restrictions and avoidance of inhalants as much as possible for a period of one to twelve months before using an antigen.

SUMMARY

Allergic symptoms begin early in life. Proper adherence to a rigid plan for introducing simple foods is informative and valuable. Recognition of symptoms suggestive of allergy will do much to delay the onset of more definite allergy and may prevent much distress. Skin tests play a big part in furnishing clues with which to work. The indirect method of skin testing is as valuable as the direct one, causes no deleterious effects on the young child's morale, and makes it possible for any child—even in a remote town—to have the advantage of adequate allergic study. The

earlier such a study is undertaken, the better the results are apt to be.

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CORROSIVE ESOPHAGITIS IN
CHILDREN

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NEW ORLEANS

INTRODUCTION

Excluding foreign bodies, most obstruc-
tions of the esophagus in children result
from ingestion of caustic agents such as
lye. All causes for esophageal obstruction
encountered among children admitted to
Charity Hospital at New Orleans in the
period from January 1942, through Decem-
ber 1947, are included in Table I, prepared
to compare relative incidence, average
duration of hospitalization, and general re-
sults of therapy for each. The gravity of
these problems hardly requires more em-
phasis than that furnished by the last
column of this table.

From a questionnaire answered by 181
large general hospitals in the United States,
Brown and Kiser¹ estimated the incidence
of lye poisoning among all admissions be-
tween 1914 and 1939 to be about 14.5 per
100,000; rates were generally highest in
southern states, the maximal reported for
any hospital being 34.9 per 100,000 admis-

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a symposium on esophageal obstructions at a meet-
ing of the Orleans Parish Medical Society on June
14, 1948.

TABLE I
ESOPHAGEAL LESIONS IN INFANTS AND CHILDREN
1942-1947

	Number of Patients	Average Number of Hospital Days	Per Cent with Satisfactory Outcome
Foreign body	161	2.5	98.7
Corrosive			
esophagitis	75	131.1	44.0
Congenital			
atresia	8	15.5	0.0
All others	6	130.3	16.6
	250		

sions. There is little or no evidence to indi-
cate that there has been any decrease in
the frequency of this accident since the
Federal Caustic Act was passed in 1927,
largely through the efforts of Chevalier
Jackson²; prevention depends more cer-
tainly on education than it does on legisla-
tion. During the six-year period covered
by this present report, the rate for lye
poisoning at Charity Hospital was 39.1 per
100,000 admissions; that specific for chil-
dren to age 12 was 169.2.

TABLE II

ESOPHAGEAL LESION	DAYS IN HOSPITAL		
	Minimum	Maximum	Average
Definite (30)	7	645	258
Probable (9)	1	404	113
Questionable (36)	4	90	30
All	1	645	131
Estimated Cost	\$6.35	\$4096.00	\$786.00
Total Cost for 75 patients at least \$62,500.00			

It has been repeatedly pointed out that
corrosive esophagitis occurs almost exclu-
sively among indigent patients. Circum-
stances giving small children opportunity
to ingest lye almost regularly bespeak the
poor educational and socioeconomic levels
of society from which such "clinical ma-
terial" is derived; the frequent occurrence
of this tragic household accident among the
patients we serve emphasizes the need for
more effective educational campaigns for
their protection. Expenditures necessary
for the care of an average patient might go
far toward the prevention of poisoning in
others. Table II indicates that even chil-
dren with *questionable* esophageal lesions

usually remain for long periods in the hospital; when one adds other medical costs to those for hospitalization alone, it becomes evident that only the very rich, the very poor, or the very well insured can afford to be careless with lye. The total cost of hospitalization for this group of 75 patients is known to be well in excess of \$60,000.00. But our purpose here is to review hospital records concerning the management of these children who were admitted for suspected or proved esophageal lesions resulting from ingestion of corrosive agents.

THE PATIENTS

Ages of children in this group centered about 24 months, with a range from 10 months to 6 years; there were 41 males and 43 females, and 57 of them were negroes. All were indigents and about a third of them came from rural areas. The records indicated nothing these children had done that would justify penalizing them by the tortures of esophageal burns and strictures for the ignorance and carelessness of their parents; in only one instance was there deliberate infanticide, all the others being classed as accidental. As noted in Table III, almost a fourth of these patients were brought to the hospital within an hour, and more than half of them within a day after they were exposed to the caustic agent; more than two-thirds of those coming later had received earlier treatment elsewhere. Regardless of these intervals, final results of therapy as indicated by proportions of from 41.2 to 45.6 per cent with satisfactory outcome did not differ significantly. By the criteria to be described later, final results seemed as good for those who were admitted late, with malnutrition and fully developed strictures, as they did for those coming to the hospital so early that there was ample time for planning the best possible course of management. This should not be interpreted as valid refutation of the potential virtues of early therapy, of course, but probably means simply that full advantage of such opportunities was not taken.

TABLE III

INTERVAL TO HOSPITALIZATION	FINAL RESULT OF THERAPY		
	Number of Patients		
	Satis- factory	Unsatis- factory	Un- certain
< 1 hour	8	2	7
2-24 hours	13	0	16
1-30 days	5	2	5
> 30 days	7	3	7
Regardless	33	7	35
	(44%)	(9%)	

THE CORROSIVE AGENT

Twenty of these children took milky-appearing solutions of lye from attractive milk or "coke" bottles usually left conveniently near drains or washtubs; 33 of the toddlers gained access to powdered lye which they might easily have mistaken for sugar; the form of lye taken by 19 patients was unspecified; one of them drank battery acid, one gulped down a piece of dry ice, and one of them swallowed a preparation of cresol. That the form in which the corrosive agent is taken is of more than academic interest is well known;³ lye is far more dangerous in solution than it is in powdered form—the latter seems to stick to the oral mucosae and is less apt to be swallowed. Judging by the data of Table IV, a significantly larger proportion of definite esophageal lesions follow exposure to solutions of lye, and end-results of therapy seem far worse than for those who took powder. Less than a fifth of those who took powdered forms, but more than half of those who took solutions eventually came to gastrostomy. From such prognostic considerations, the importance of learning the form of lye taken should be obvious. By comparing results after powders or solutions to those following exposure to unspecified forms of lye, one judges that most of the latter were probably liquid also. There was no doubt that each of 72 children were exposed to lye in some form, and the nature of other corrosive agents was definitely stated for the remaining three.

ESOPHAGEAL LESIONS

All of the 75 children had ulcerations or scars of the oral mucosae, if not already established esophageal lesions; we considered that there was ample justification for

TABLE IV

ESOPHAGEAL LESION	FORM OF LYE			
	Dry (33)	Solution (20)	Unspecified (19)	Other (3)
Definite	5 (15%)	11 (55%)	13	1
Probable	4	2	3	0
Questionable	24	7	3	2
Result of Therapy				
Satisfactory	16	9	6	2
Unsatisfactory	0	3 (15%)	4 (21%)	0
Uncertain	17	8	9	1

at least suspecting the presence of corrosive esophagitis in each case. The problem then became one of establishing—by real evidences of recurrent or continuous dysphagia, by obstruction to the passage of bougies, by esophagrams, or by direct esophagoscopy—which ones really had esophagitis or stricture. Judging from information available in the voluminous records of these 75 patients, the quality of initial diagnoses left much to be desired; we have summarized all the data as to the presence of esophageal lesions in Table V. One notes several rather striking shortcomings: (a) There was a remarkable paucity of pertinent objective information as to the presence of esophageal lesions during the early period, which we have empirically drawn at two weeks from the time of exposure to the corrosive agent; it is generally appreciated that real symptoms of stricture rarely develop in this interval and that the presence of esophageal lesions can only be established at this time by careful direct study. After the first two or three days, when it is difficult to distinguish true dysphagia from refusal to take food or fluid across the burned mouth or pharynx, there is usually an interval of two or three weeks before definite obstruction to swallowing occurs. It is during this interval that repeated esophagrams and careful esophagoscopy examination should be carried out to determine which patients actually need further therapy. (b) Definite or equivocal evidences of dysphagia were recorded for only a fifth of these children during the first two weeks and for less than half of them later. Failure to develop late evidences

TABLE V
DIAGNOSIS OF ESOPHAGEAL LESIONS

EVIDENCE	INTERPRETATION			
	Positive	Negative	Questionable	No data or not done
<i>Dysphagia</i>				
early	11	60	4	0
late	35	39	....	1
<i>Bougienage</i>				
early	2	45	3	25
late	30	31	2	12
<i>Esophagram</i>				
early	3	5	....	67
late	18	6	1	50
<i>Esophagoscopy</i>				
early	....	2	2	71
late	16	3	2	54

of dysphagia might be interpreted to mean that the patients had no esophageal lesion to begin with, or that early therapy had been successful in preventing a stricture; in either case, the importance of learning the true state of affairs and incidentally of guiding therapy by more direct means seems obvious. (c) Obstruction to the passage of a bougie is not encountered very often during the first two weeks, but after this time it is a more positive diagnostic procedure. (d) Early or late esophagrams were made for only 32 of the 75 patients, and esophagoscopy examinations were done for only a third of them; all but 4 of the latter procedures were done late, in patients who already had definite symptoms of stricture. Such deficiencies can only be interpreted to mean lack of interest or lack of faith in the validity of these procedures for purposes of diagnosis; here again, regardless of interpretation, the importance of employing such diagnostic aids at a time when they can be useful in guiding intelligent therapy seems all too evident. In passing, it is of some interest to note that esophagoscopy examinations yielded more equivocal reports than did the esophagrams, though certainly no significance can be attached to such a small number of observations. (e) The large number of charts which contained no record of any diagnostic bougienage, any esophagram, or any esophoscopic examination is appalling; we do not

believe that such deficiencies in the records are necessarily a true reflection of deficiencies in the care these patients received, but may be due in large part to wartime shortages of hospital personnel.

From data of this sort, each suspected esophageal lesion was characterized as either definite, probable, or questionable; this was necessary before therapy could be evaluated. In the first group are included 30 children who had classical symptomatology or objective demonstration of esophageal obstruction; in the probable category are 9 who had equivocal symptomatology, or who were not examined adequately, or for whom there were discrepancies among various diagnostic procedures employed; the 36 questionable cases are those for whom there were no recorded evidences of real dysphagia and no demonstration of obstruction by any means at any time during the period of study. It should be re-emphasized here that there seemed to be ample justification for therapy based on a diagnosis of presumptive corrosive esophagitis in every case—all these children had been exposed to known corrosive agents, and all of them had oral lesions or evidences of esophageal obstruction at the time they were admitted.

TABLE VI

THERAPY	ESOPHAGEAL LESION		
	Definite (30)	Probable (9)	Questionable (36)
Dilatation from above			
Regular	7	2	10
Irregular	13	2	24
No data	10	5	2
Gastrostomy, etc.	28	1	0
Total Satisfactory Results	13	3	17
	(43.3%)		

The type of therapy employed for definite, probable, and questionable cases is briefly summarized in Table VI. The records indicate that only 20 of the 30 children with definite esophageal lesions were treated by any type of bougienage from above; general criteria for regularity as set

down by Salzer,⁴ Bokay,⁵ or more recent authors,⁶⁻¹⁰ were met for only 7. Only 2 of 9 probable lesions, but 10 of 36 questionable ones were dilated regularly. There were 29 gastrostomies, all but one of which were done for definite esophageal strictures; in this remaining case, the presence of a stricture was never definitely established but gastrostomy was done one month after the ingestion of lye because of questionable dysphagia and equivocal reports from roentgenographic and esophagoscopy examinations. Up to the time of gastrostomy, 16 of these patients were treated elsewhere, so all of these deficiencies are not entirely attributable to oversights and delays in crowded clinics and wards, or to rapid turnover of professional personnel in a large teaching hospital.

TREATMENT AND RESULTS

a. *General Measures*

Indications for the immediate use of mild neutralizing agents, demulcents, and analgesics hardly require comment; the excruciating pain of corrosive stomatitis or esophagitis needs only to be seen to be appreciated. Adequate fluid and caloric intake usually requires careful parenteral feeding during the first three days when these children cannot tolerate anything by mouth. Concomitant aspiration of the corrosive agent occasionally produces evidences of laryngeal obstruction severe enough to require early tracheotomy. With the copious salivation noted in all these children and their obvious disinclination to swallow or cough, it is not surprising to find that most of them have evidences of aspirational pneumonitis. At least until they are able to clear or swallow their own secretions, they should be carefully positioned for maximal postural drainage within bounds of comfort and should receive prophylactic parenteral antibiotic or chemotherapy against otherwise almost inevitable bronchopneumonia. Gastric lavage is rarely indicated—perhaps only if it is known that a very large amount of lye was taken less than an hour earlier; besides increased dangers of perforation, the likelihood of aspiration is enhanced by this maneuver.

Most deaths occurring within three days after ingestion are due to coincident aspiration causing laryngeal edema or more extensive lesions in the trachea and bronchi; this seemed to be true in the single early death among the present series:

J. W., a colored male aged 12 months, took an unknown amount of lye solution from a "coke" bottle; he immediately cried, gagged, coughed, and was rushed to the hospital. On admission, he was dyspneic, cyanotic, and had obvious laryngeal stridor; there were extensive burns of the lips, tongue, buccal mucosae and pharynx, and the child vomited strongly alkaline coffee-ground material. Oxygen through an airway relieved the respiratory distress; supportive and symptomatic therapy was carried out according to our usual routines and with apparent improvement, but nine hours after admission the infant suddenly died. Permission for autopsy was refused; death was attributed by the coroner to acute toxemia following lye ingestion.

Procedures used for esophageal dilations are briefly summarized in Table VII. We considered results satisfactory if the patient exhibited no apparent malnutrition or dysphagia for a period of six months since last treatment. Results were classed as unsatisfactory if the patient died, if dysphagia or malnutrition persisted, or if a given form of therapy was discontinued because it was accomplishing nothing toward the relief of stricture or atresia. Among 35 finally uncertain results were 21 with only questionable or probable esophageal lesions who have been delinquent for follow-up studies since they left the hospital, 10 with definite esophageal strictures who have not yet been followed for six months since they were last treated, and 4 who are still being treated outside the hospital.

TABLE VII

PROCEDURES FOR DILATATION	RESULT		
	Satis- factory	Unsatis- factory	Un- certain
None	1	2	5
Bougienage			
—from above*	18	18	21
Gastrostomy, etc.	13	6	10

*See Table VIII.

b. *No Dilatations*

No form of dilatation was accomplished

for 8 patients; one of these, who was known to have had a satisfactory result, never had any real evidences of an esophageal lesion after subsidence of the transient early period of severe stomatitis. The 5 with uncertain results were all delinquent, but none of them had proved esophageal lesions and the very fact that they have not returned to the hospital suggests that they have not developed strictures. A brief protocol for one of the patients with unsatisfactory outcome was cited above, and that for the second one follows:

C. W., a colored female of 15 months, was admitted one month after swallowing an unknown amount of an unspecified form of lye and two weeks after onset of progressive dysphagia. She was emaciated, dehydrated, and an esophagram showed narrowing of the middle third of her esophagus; direct blind bougienage and attempts to pass a string were both unsuccessful, and esophagoscopy examination disclosed several large granulating areas beginning at a level 17 cm. from the incisor teeth. Following this diagnostic procedure, the temperature rose sharply and eighteen hours later the infant suddenly expired under circumstances that suggested the likelihood of aspiration. Autopsy was not done. There was nothing in the record to indicate that any form of dilatation had been carried out; plans had been made for early gastrostomy and retrograde dilatation.

c. *Bougienage*

Dilatations by some form of bougienage from above were attempted for 57 of the 75 patients; 8 of the 18 remaining had no type of dilatations at all, and the other 10 came to gastrostomy and retrograde procedures because earlier attempts at dilatation from above had been unsuccessful. Among patients with definite esophageal lesions, there was not one single recorded satisfactory result after this form of treatment; attempts were made over periods of hospitalization of from seven to one hundred and eighty days. Among 18 patients with definite lesions for which bougienage was tried, all but one result had to be considered unsatisfactory—the remaining one has not yet been followed long enough to be sure, but is the only one who has not yet gone on to gastrostomy. Among those with probable and questionable esophageal lesions, results were not quite so poor, though it is of some interest to note the long periods

over which this form of therapy was used—in several instances continuing for thirty-five to forty months, and averaging over a year for probable esophageal lesions, almost five months for those who had never had any real evidences of esophageal lesions recorded at any time! Such results obviously cannot be explained away by the severity of the esophageal lesions treated; they are more logically attributable to the poor cooperation of parents so careless as to permit tragic accidents of this sort in the first place, by distances many patients had to travel, and by oversights and errors inherent in such factors as: (a) lack of any comprehensive integrated schemes for treating these patients, (b) meager evidences of interdepartmental planning of definite therapy based on careful evaluation during the first few weeks, and (c) rapid turnover of professional personnel of the hospital—particularly during the war. Recognizing these faults, and the fact that results of all types of bougienage used for treatment of esophageal lesions from above have been satisfactory for less than a third of the patients so treated, the road to improvement should be clear.

TABLE VIII

BOUGIENAGE — 57 PATIENTS

ESOPHAGEAL LESION	AVERAGE DURATION OF THERAPY, DAYS	RESULTS		
		Satis- factory	Unsatis- factory	Un- certain
Definite	50	0	18	1
Probable	378	1	0	3
Questionable	144	17	0	17

It is encouraging to note that there were no deaths attributable to bougienage from above—whether blind, over a string, or esophagoscopically directed; this may, of course, reflect a considerable lack of enthusiasm and diligence in employing these procedures, suggested by the earlier observations (Table VI) that they met any conventional criteria for regularity in only 19 patients. To us, there seems little doubt that dilatations carried out according to the Salzer and Bokay routine *can* be far more successful than these results have indicated, but this would require much longer-continued and more generous portions of

what we choose to call the doctor-patient relationship. We have no doubt that these routines, as again recently elaborated by Gellis and Holt⁷, are the procedures of choice—provided they can be begun early, that cooperation of the child's parents can be assured for a long period of time, and that there can be careful individualized planning for each individual patient. Lacking such provisions or assurances, it is not surprising that results are as poor as they have been with the present group of patients. It seems worth reemphasizing that results were satisfactory in less than a third of these patients and that there was not a single satisfactory result for anyone known to have had a definite esophageal lesion.

d. Gastrostomy and Other Procedures

Gastrostomies were done for 29 patients at intervals of from fifteen days to five years and averaging almost five months after ingestion of the corrosive agent. Nineteen patients came to gastrostomy only after earlier attempts at dilatation from above had been given up, and so far as we could determine the remaining 10 patients had not received previous dilatations of any sort before they arrived at the hospital with strictures impossible to pass from above. All of them came to operation in varying degrees of malnutrition and none of them were considered good risks even for this relatively simple operation. Gastrostomy

TABLE IX

GASTROSTOMY AND OTHER PROCEDURES—
29 PATIENTS

<i>Interval:</i>	15 days—5 years; average, 4.7 months
<i>Duration:</i>	1 month—7½ years; average, 22.4 mo.
<i>Results:</i>	Satisfactory 13
	Unsatisfactory 6*
	Uncertain 10

*See text.

tubes were left in place for periods of from one to eighty-nine months, averaging over twenty-two months. Following retrograde and combined dilations during this time, satisfactory results were finally achieved for 13 of these patients and 10 others are still uncertain. In one patient, retrograde dilations were not successful, and a satisfactory result was finally secured only after esophagogastric anastomosis done seven

months after gastrostomy. There were 5 other unsatisfactory results of gastrostomy, with subsequent retrograde or combined methods of dilatation; brief protocols for these:

G. S., a colored male 21 months old, was admitted almost immediately after swallowing an unspecified amount of an unknown form of lye; after subsidence of early acute symptoms, he was treated irregularly by bougienage. Within two weeks after the accident he had developed symptoms of true dysphagia, and an esophagram showed rather extensive narrowing in the upper third. Gastrostomy was then done, and his course seemed uneventful until eight days later when he pulled his tube out; attempts were made to reinsert this immediately on the ward and the child developed a generalized peritonitis. After a stormy course, he improved sufficiently so that two weeks later the gastrostomy was revised and the tube reinserted. Judging from the record, everything went along fairly well until the forty-sixth hospital day, about a week after this revision, when the child was found dead in his crib. At autopsy, extensive peritoneal abscesses were demonstrated, the largest being situated in the right subdiaphragmatic space.

J. D., a colored male 2 years old, was admitted to another hospital and treated there for a month after taking an unspecified form of lye; at the time of discharge he had no dysphagia and esophagrams were interpreted as showing no evidence of obstruction. When he returned there two and one-half months later with definite evidences of obstruction, he was referred to our hospital. He was dehydrated and malnourished on admission, esophagrams and direct esophagoscopy demonstrated a stricture of the lower third. Blind and string-directed bougienage for the next two months failed to relieve the obstruction sufficiently, so gastrostomy was done five and a half months after the lye had been ingested. Results were apparently improved by retrograde methods and combined procedures were then carried out in the clinics. Four months after the gastrostomy and eighteen days after what seemed to be a fairly simple dilatation in the clinic, the child developed unmistakable evidences of increased intracranial pressure. Studies completed immediately after re-admission indicated the presence of a large abscess in the right occipital area; the patient expired after craniotomy and during attempts at extracapsular removal of the abscess. Autopsy was not done.

G. J., a colored female of 18 months, swallowed an unspecified amount of an unknown form of lye three weeks prior to admission to our hospital. Immediately after the accident, the referring physician had lavaged the stomach and then after partial subsidence of early stomatitis had made unsuccessful attempts at bougienage. On arrival

at the hospital she was febrile, dehydrated, and had evidences of bilateral pneumonitis. Further attempts at bougienage here were unsuccessful; after preliminary correction of dehydration, gastrostomy was then done on the sixth hospital day. Esophagoscopy and retrograde dilatation were attempted at that same time but the record contained no report of the results of these procedures. On the second postoperative day the child suddenly developed convulsions and died. Though meningitis or brain abscess following mediastinitis due to rupture of the esophagus might be suspected, permission for autopsy was refused; the coroner's final diagnosis was aspiration pneumonia following lye ingestion.

J. F., a colored male of 12 months, was admitted three weeks after taking an unknown amount of an unspecified form of lye and ten days after onset of progressive dysphagia. Gastrostomy was done almost immediately after admission and retrograde dilatations were carried out regularly, first in the hospital and later in the clinics. About eleven months after the ingestion of lye and two weeks after an apparently uneventful dilatation, he was readmitted in coma and with classical evidences of increased intracranial pressure; craniotomy was done for drainage of a large left parietal abscess; the patient's condition remained critical and he expired two days later. Autopsy revealed multiple brain abscesses.

D. J., a colored female of 12 months, was malnourished, dehydrated, and could swallow only small sips of liquids when she was admitted one month after taking an unknown amount of lye solution. Attempts to pass the stricture with bougies or to demonstrate it with esophagrams were unsuccessful, but esophagoscopy showed it to be high. During these diagnostic procedures the child had two rather severe bouts of aspirational pneumonitis. Gastrostomy was done five weeks after admission, after which apparently successful dilatations were carried out until two months later when the infant died during an acute febrile episode for which a clinical diagnosis of mediastinitis was made. No autopsy was secured.

SUMMARY AND RECOMMENDATIONS

Nowhere has any method yet devised for treating corrosive esophagitis in children yielded completely satisfactory results, but those achieved for 75 children admitted to Charity Hospital during the past six years with suspected or proved lesions of this sort have been particularly poor. The present study has disclosed several rather obvious faults and the reasons for some of them, but would have little purpose unless it led to a few suggestions for their correction:

1. Intensification of educational cam-

TABLE X

OUTCOME FOR ALL CHILDREN

ESOPHAGEAL LESION RESULTS OF ALL THERAPY

ESOPHAGEAL LESION	Satisfactory	Unsatisfactory	Uncertain	Total
Definite	13	6	11	30
Probable	3	1	5	9
Questionable	17	0	19	36
Total	33	7	35	75

(44%)

paigns for the prevention of lye poisoning in this area may be amply justified by economic considerations alone; perhaps no group of patients causes a greater financial drain to the hospital caring for them.

2. Inordinately long periods of hospitalization could be materially shortened by careful cooperative planning based on early objective studies of each case. Such planning requires the best talents and judgment of pediatrician, radiologist, endoscopist, surgeon, and social worker. Evaluation of parental attitudes and socioeconomic factors should have at least equal weight with purely anatomic considerations in arriving at decisions as to the best type of therapy for each of these patients.

3. Early diagnostic studies must be carefully individualized but need not interfere with any plan for regular bougienage during the first few weeks. When symptoms are definite, a single esophagram may be all that is necessary to define the site and extent of the esophageal lesion; when evidences of dysphagia are equivocal or absent, *repeated* esophagrams and esophagoscopy examinations may be necessary. Certainly, it ought to be possible to determine within thirty days which patients require prolonged therapy and which ones may be discharged and instructed to return at the first evidences of difficulty in swallowing. For the present group of patients, full advantage has not been taken of the diagnostic facilities any large modern hospital has to offer.

4. We believe that there is enough evidence to indicate that the familiar Salzer or Bokay routines constitute the best method of therapy for all suspected esophageal lesions due to corrosive agents, provided cooperation for their orderly com-

pletion can be assured. When careful studies justify continued bougienage as the procedure of choice, adequate steps should be taken to assure regularity of such therapy in the out-patient departments; any inconvenience this might occasion for the staff would be overbalanced by more important considerations centering about emotional disturbances and serious intercurrent infections so common among children of this age who remain for long periods in hospitals. When, on the other hand, it seems obvious that parental cooperation for a period of at least six months cannot be assured, or if lesions are too extensive or do not respond satisfactorily to preliminary dilatations, then more serious consideration should be given to earlier definitive surgical procedures at a time when such patients can still be considered fit surgical risks.

5. Candidates for gastrostomy are those whose esophageal lesions have been neglected, who have the most severe strictures, or who have failed to respond to earlier therapy. In any case, the fatality rate in this group—related largely to later attempts at dilatation—has been over 17 per cent; faced with this risk, there is added justification for considering earlier anastomosing procedures, rather than persisting in attempts at dilatation by mechanical means over longer periods.

6. It is hoped that recognition of the generally poor results which have followed treatment of corrosive esophagitis in our own hospital during the last six years will lead to logical steps toward their improvement.

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CARE OF THE TOXIC NEWBORN

J. D. RUSS, M. D.*

NEW ORLEANS

Toxemia of the mother is one of the most difficult problems faced by the obstetrician; toxemia as a complication in the newborn is frequently overlooked and too often leads to a mortality which might have been prevented. There is no doubt that care of the toxic newborn must begin prior to the time of delivery. Detailed knowledge of the proper analgesics to use, type of delivery to be undertaken, length of labor to be permitted to the toxic mother, nutrition of the mother, oxygen intake of the mother, type of anesthetic to be employed, all have important effects not only on the mother but also on the baby. This is important to such an extent that if proper knowledge is employed in all of these particular factors, more babies can be saved. The use of the proper analgesic, for instance, will in most cases improve the prognosis for the baby long before it is born. These factors are most important when prematurity complicates the situation.

In order to understand how to handle a toxic baby, it is necessary to know what complications, resulting from toxemia, may occur in the baby. These may be divided into two groups: (1) those complications occurring at the time of delivery; (2) those complications (which may be termed delayed complications) which are often apparent during the first ninety-six hours after birth.

A. IMMEDIATE COMPLICATIONS

1. Failure to Initiate Respiration or Establish Respiratory Rhythm.

Signs and Symptoms:

- a) Rising or falling fetal heart rate before delivery.

- b) Failure of infant to take breath within thirty seconds of severing cord.
- c) Irregular shallow respiration.

Prophylaxis:

- a) Trained resuscitator at delivery.

Treatment:

- a) Proper resuscitation.

2. Prolonged Cyanosis.

Signs and Symptoms:

- a) Purplish blue cyanosis of hands, feet, and lips; circumoral pallor.

Prophylaxis:

- a) Proper resuscitation.
- b) Oxygen (35-40 per cent) for twelve hours after birth, and as necessary thereafter.

Treatment:

- a) Early intratracheal aspiration.
- b) Thirty per cent carbon dioxide and 70 per cent oxygen for ten to fifteen seconds every thirty minutes.
- c) Continuous oxygen as long as cyanosis persists.
- d) Make baby cry as much as possible.
- e) Small transfusions

3. Cerebral Hemorrhage.

Signs and Symptoms:

- a) Cyanosis.
- b) Short shrill cry.
- c) Flaccidity at the onset, gradually changing to varying degrees of spasticity.
- d) Asymmetrical paralysis.
- e) Failure to suckle.
- f) Fever.

Prophylaxis:

- a) Minimal trauma.
- b) Use of outlet forceps instead of spontaneous delivery. Cesarean section in selected cases.

Treatment:

- a) Entirely symptomatic.
 1. Vitamin K (5 mgm. intramuscularly daily).
 2. Elevation of head.
 3. Oxygen.
 4. Minimal handling.
- b) Parenteral or gavage feeding in absence of suckling reflex.

4. Atelectasis.

Signs and Symptoms:

- a) Recurrent periods of apnea.
- b) Mottling of skin.
- c) Cyanosis.
- d) Shallow, jerky respiratory pattern.
- e) Inadequate movement of thoracic cage.
- f) Dullness on percussion, and absent or very faint breath sounds upon auscultation over affected area.
- g) Irregular rapid pulse.

Prophylaxis:

- a) Intratracheal aspiration at birth.

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- b) Head of crib elevated.
- c) Continuous oxygen for first twelve hours of life, longer if symptoms persist.
- d) Hyperventilation; encourage frequent crying.

Treatment:

- a) Repeated intratracheal or bronchoscopic aspiration.
- b) Inhalations of 30 per cent carbon dioxide and 70 per cent oxygen for ten to fifteen seconds every thirty minutes. Continuous oxygen otherwise.
- c) Encourage frequent crying.

B. DELAYED COMPLICATIONS

1. Increased Tendency to Hemorrhage.

Signs and Symptoms:

- a) Prolonged bleeding and prothrombin time.
- b) Oozing from cord stump, or other sites.

Prophylaxis:

- a) Vitamin K to mother orally for seven days before delivery.
- b) Vitamin K to baby at birth, and daily for three days.

Treatment:

- a) Small transfusions, repeated as necessary.

2. Gastrointestinal Disturbances.

Signs and Symptoms:

- a) Decreased or sluggish suckling reflex; apathy.
- b) Regurgitation, gagging.
- c) Immediate and delayed vomiting (watch for aspiration).
- d) Frequent meconium stools, often diarrhea.

Prophylaxis and Treatment:

- a) Water only for forty-eight to seventy-two hours; then weak formula.
- b) Maintain fluid intake by clyses (saline or 5 per cent dextrose in water) four times a day, as necessary.
- c) No breast feeding.

3. Generalized Toxicity.

Signs and Symptoms:

- a) Rapid, irregular, weak pulse.
- b) Periodic apnea.
- c) Anuria.
- d) Cyanosis.
- e) Pallor.

Prophylaxis and Treatment:

- a) Oxygen.
- b) Parenteral fluids, to assure adequate diuresis.
- c) Incubator care, as for premature infant.

Immediate treatment of the baby thus consists of proper resuscitation followed by transfer to an incubator with continuous oxygen. It is far better to place the baby with the head elevated rather than the reverse, which is routine practice in many hospitals.

Following immediate treatment, the baby

is not handled unless necessary and then parenteral fluids are instituted rather than oral feedings. Failure of the suckling reflex increases the possibility of aspiration. Only after forty-eight to seventy-two hours should oral feedings be started. Breast feeding from the mother is not advisable as the milk may be toxic and cause vomiting or diarrhea.

In spite of all precautions and treatment, toxic babies are notorious for sudden change in their course. In many cases, for no perceptible reason, death ensues suddenly. The prognosis should be guarded for ninety-six hours. After this period of time, the outlook is immeasurably improved. Close observation and careful nursing greatly improve the prognosis during the first ninety-six hours.

SUMMARY

In order to prevent as many complications as is possible, it is necessary to understand that analgesia should be as light as feasible, that delivery be as atraumatic as possible, that length of labor itself be held to a minimum, that the anesthetic employed be one that is not injurious to the baby. The mother should have had proper nutrition, and a proper fluid and mineral balance. Oxygen should be given to the mother, preferably just before labor, during labor, and at the moment of birth. Once these measures have been undertaken, the necessity of a trained resuscitator at the delivery cannot be overemphasized. The very recognition that toxemia exists is itself sufficient evidence that trouble is apt to ensue, and the necessity for immediate proper resuscitation of the baby is a prime point. After-care of the baby, once he has been resuscitated and removed to the nursery, consists primarily of heat, fluids, and a minimum of handling. Following the above simple routines may lower the mortality among toxic babies to such an extent that toxemia will no longer hold the dread place it occupies at present.

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LOUISIANA STUDY OF CHILD HEALTH SERVICES

CHAPTER VI HOSPITALS

The role of a modern hospital as the focal point for good community health programs is too well understood to require elaboration. This chapter will be concerned with an analysis of total child care furnished by the hospitals of our state during the study period of 1945-46, with a brief review of the number, size, and distribution of these hospitals, an examination of their facilities, services, policies, and admission rates for infants and children, and a discussion of some specific characteristics by which the quality of hospital care extended to our young patients may be measured or compared.

There were 128 hospitals in Louisiana, of which 6 were designated as special, 122 as general. Seventy-six of the latter had less than 25 beds each, and 16 of them had 100 or more beds each; 119 of them admitted children and 121 of them cared for newborns. Fifty-five of these hospitals were registered by the American Medical Association. The 122 general hospitals cared for over 86,000 infants and children as in-patients during 1946. In other words, about 1 out of every 9 children in the state was born in or admitted to a hospital during that year.²⁶ If we exclude some 38,000

hospital births, this figure would still be about 1 out of 16 infants and children under age 15 admitted to our hospitals in a single year; though with obvious duplication, a much higher index of service to the children of our state could be easily justified by including in our calculations a large number of young individuals seen in out-patient departments (estimated at 37,500 visits). Eleven hospitals in the state had out-patient departments admitting children, and 7 of these conducted separate pediatric clinics.

FACILITIES AND SERVICES FOR SICK INFANTS AND CHILDREN

The fact that the largest hospitals are located in the largest cities accounts for the finding that more than two-thirds of all general hospital beds in the state are in its three areas of greatest population density. There are no special pediatric hospitals in the state and only 18 of our larger general hospitals had 5 or more beds set aside exclusively for the use of children; these 18 admitted 31,406 of the 47,366 children other than newborns hospitalized that year. Altogether, the pediatric units in these 18 hospitals comprised 880 beds, about 9.6 per cent of all general hospital beds in the state; this compares favorably with an average figure of 9.3 per cent for the entire United States.²⁷ Approximately 75 per cent of all hospital beds set aside exclusively for children were in just 5 large metropolitan hospitals and these admitted more than 40 per cent of all children hospitalized during the year of study.

It was interesting to note, as a measure of "turnover," that there was an average of 5.2 child admissions for each of the 9,146 total general hospital beds; this ratio varied among the hospitals from 2.6 to 8.2, being highest for small institutions and for those situated in isolated parishes.

There were 11.8 general hospital beds including 1.13 specific pediatric beds for every 1000 children in the state; though only slightly below the national averages, again there appeared striking differences

²⁶As of July 1945, there were 775,861 individuals under age 15 in Louisiana.

²⁷Health Services for Children in the United States, American Academy of Pediatrics. To be published.

in favor of metropolitan areas. Data concerning hospital beds for children in metropolitan and isolated areas of Louisiana are compared with those for the United States generally in Table XVI.

TABLE XVI
HOSPITAL BEDS FOR CHILDREN

	NUMBER PER 1000 CHILDREN	
	Total Beds in General Hospitals	Beds Set Aside for Children
United States, average.....	12.8	1.2
Highest ranking state.....	28.5	2.4
Lowest ranking state.....	5.5	0.2
Metropolitan and adjacent areas	15.4	1.6
Isolated areas	8.4	0.5
Louisiana, average.....	11.79	1.13
Metropolitan and adjacent parishes	20.38	2.34
Other parishes	6.04	0.33

It is of more than passing interest to note incidentally that these ratios for Louisiana were higher than those for any other southern state, and rank us in about twenty-eighth place among all 48 states. Because all of the separate pediatric units were located in the larger hospitals, it was not surprising to find that 29,143 out of 47,366 total child admissions were to the 14 hospitals having more than 100 beds each. Ratios for total child admissions to all general hospitals during the study period were slightly more than 61 per 1000 children (excluding newborns)—93.7 per 1000 in metropolitan and 39.2 per 1000 in isolated parishes. These figures may be compared with the national average of 51 per 1000; Louisiana ranks in seventeenth place among the 48 states in this respect. Differences as to metropolitan and isolated parishes are of about the same order of magnitude as those expressed earlier in Table XVI. Of the 122 general hospitals, 3 restricted admissions to negro patients and 81 accepted both white and non-white; in the metropolitan parishes, the rate of hospitalization for negro children was about equal to that for white children. The very small hospitals of the state—76 of them with less than 25

beds each—accounted for about 16.4 per cent of total child admissions and nearly a fourth of all hospital deliveries.

Only 2 hospitals in the state were reported to have isolation units of 10 or more beds set aside for communicable diseases in children; 77 hospitals reported that isolation and/or cubicle-separation procedures were followed for new child admissions. Perhaps representative of policies concerning a number of communicable diseases was the finding that 35 out of 46 hospitals having 25 or more beds would accept cases of poliomyelitis for diagnosis and emergency treatment only, and but 2 would accept such cases for care. Thirty of these larger hospitals reported that individual equipment, such as towels, washbasins, and thermometers, was *not* used for infants and children, yet 42 of them used only pasteurized milk for their young patients.

One could hardly expect hospitals of less than 25 bed capacity to have 5 or more beds set aside exclusively for the use of children—pediatric units. It was mentioned before that 18 of the 46 larger hospitals had such units; of the 18, however, only 4 had separate wards for sick infants. Eighteen of all the general hospitals in the state had regular house staffs; 8 had interns or residents assigned to pediatric units; and 17 of them had graduate nurses on duty at all times in such units. Twenty-five hospitals had dietitians on their staffs, and 8 of them had organized social service departments.

While 59 of the 122 hospitals had clinical laboratories, a few selected procedures considered necessary for good pediatric practice could be obtained in 32 of them. Oxygen equipment suitable for children was found in 69 of the 119 hospitals which admitted children. Blood or plasma banks were present or easily accessible to 42 of the 46 larger hospitals, and 27 of these had Rh-negative blood readily available for transfusions.

Unquestionably, some of these deficiencies have been corrected since our survey was made, yet many of them still exist. Though these items certainly do not entirely measure the adequacy of hospital fa-

cilities for the care of sick infants and children, they do constitute the best measurable indices available; they were collected with great care, and they do seem clearly to indicate several logical directions for improvement.

HOSPITAL CARE FOR NEWBORN INFANTS

For a number of well known reasons, there has been a tremendous increase in the percentage of babies born in hospitals, particularly during the past ten years. In 1935, 37 per cent of all babies born in the United States were born in hospitals, and in 1946 the percentage had risen to 82.4, more than double; in many metropolitan areas more than 95 per cent of all babies are born in hospitals.

There were 38,835 births in the hospitals of Louisiana during the period of this study, and the average duration of hospitalization for the neonatal period was 5.1 days. Eighty-five per cent of all white births and 48 percent of negro births in Louisiana in 1946 were in hospitals; these figures are higher than the averages of 70 and 25 per cent respectively found for 12 southeastern states, and are exceeded for this area only by the figure of 88 per cent for white births in Florida. Of the total hospital admissions to age 15, those arriving via the delivery rooms made up almost 45 per cent. The magnitude of these proportions emphasizes the importance of careful planning of nursery facilities in new hospitals and good training programs to furnish personnel to run such units. From the fact that there were 1400 bassinets and 196 incubators in the hospitals, it can be easily calculated that this equipment was abundantly used; if 5 per cent of the hospital births were premature infants—a very conservative estimate—there were about 10 prematures for each incubator that year. While there were accommodations for about 1600 newborns, there was a grand total of 9146 beds available for all other ages in the same hospitals—5.7 times as many.

It is noteworthy that 34.4 per cent of all these babies were born in the 6 largest hospitals having 250 or more beds, and that 23.5 per cent of them were born in the 76

hospitals having less than 25 beds each. Only 6.4 per cent of hospital births in the metropolitan areas occurred in small hospitals, but over 44 per cent of those in isolated parishes were in hospitals with less than 25 beds. Total hospital admissions for newborns and other children are compared with corresponding population data for the same period in Table XVII.

TABLE XVII
HOSPITAL BIRTHS AND CHILD ADMISSIONS IN LOUISIANA DURING ONE YEAR, COMPARED TO POPULATION OF NEWBORNS AND OTHER CHILDREN

Admissions	
Newborns	38,835
Sick infants and children.....	47,366
Population	
Newborns (1945)	57,838
Children to age 15.....	775,861

QUALITY OF HOSPITAL CARE

Any survey, no matter how carefully designed and conducted, can do no more than measure—largely on a comparative basis—only a few of the numerous factors which determine the quality of care extended to patients. It is not entirely fair to assume that apparent deficiencies or excesses in a small number of measurable items necessarily reflect similar variations in qualities which do not lend themselves so readily to numerical consideration. There is no reason to assume, for example, that a state having no special children's hospital has no place to care for sick children. Despite such recognized limitations, this study of a few items which could be enumerated has permitted a number of interesting comparisons concerning the quality of hospital care for children in Louisiana.

The items we have chosen to measure, because we believe they have a direct relation to the kind of service rendered to children by hospitals, include American Medical Association registration, separation of space, organization of medical, nursing, and dietary staff, and provision for selected services generally accepted as necessary for good pediatric practice. In Table XVIII, some of these data pertaining to 46 hospitals in Louisiana having 25 or more beds each are compared with those of corresponding size and distribution over the entire United States.

TABLE XVIII
PER CENT OF CHILD ADMISSIONS TO LARGER HOSPITALS*
WITH SPECIFIED CHARACTERISTICS

	Louisiana			Entire United States		
	Average, per cent	Metropolitan and Adjacent Parishes, per cent	Isolated Parishes, per cent	Average, per cent	Metropolitan and Adjacent Counties, per cent	Isolated Counties, per cent
Separate pediatric unit.....	79	89	56	76	83	52
Separate ward for infants other than newborn	13	11	18	54	61	32
Graduate nurse on duty at all times in pediatric unit.....	74	81	56	63	70	38
Any house staff.....	68	85	27	62	76	18
Clinical laboratory.....	96	99	88	90	94	75
Selected laboratory services available.....	90	95	76	81	88	58
Trained dietitian on staff.....	78	90	49	80	88	56
Average for 7 characteristics.....	71	78	52	72	80	47

*Having 25 or more beds, and admitting children.

A quick glance at these figures indicates that these hospitals in Louisiana compare favorably with averages for the entire country except as to separate facilities for the care of sick infants; there is gratifying agreement in the quality of hospital care for infants and children in our state and in the country generally, as determined by mean values for the seven characteristics we used as yardsticks.

Expressed another way, all of the 18 hospitals in Louisiana with separate pediatric units were registered by the American Medical Association; 22 per cent of them had a separate ward for infants other than newborn; 72 per cent of them had a house staff; and 94 per cent of them reported that they had a graduate nurse on duty at all times in their pediatric units; 94 per cent of these hospitals had clinical laboratories and selected laboratory services were available in 88 per cent of them; 83 per cent had qualified dietitians on their staffs.

There is no doubt that general facilities for care of patients are less adequate in very small hospitals anywhere in the United States, regardless of urban or rural location. In Louisiana, about 23.5 per cent of all hospital births and 16.4 per cent of all other children hospitalized were in hospitals having less than 25 beds. Four easily measurable deficiencies of these small hos-

pitals appear in the brief tabulation which also serves to remind us of several problems incident to current programs for new hospital construction in rural areas.

TABLE XIX
PROPORTIONS OF SMALL AND LARGE HOSPITALS IN
LOUISIANA HAVING SPECIFIED CHARACTERISTICS

	LESS THAN 25 BEDS		25 OR MORE BEDS
	Metropolitan parishes, per cent	Isolated parishes, per cent	Average for state, per cent
Registered by A. M. A.....	13.3	31.1	73.9
Separate nursery for newborns only	46.7	52.5	82.6
Graduate nurse on duty at all times in nursery..	6.7	4.9	58.7
Clinical laboratory in hospital	26.7	24.6	87.0

SPECIAL HOSPITALS

For purposes of this study, 6 hospitals in Louisiana were classed as "special" inasmuch as their services were restricted to particular disorders and their organization was such that it did not lend itself to the type of tabulations used for the other hospitals hereinbefore classed as "general." The relatively small, but nevertheless very important contribution these 6 special hospitals make to the total amount of medical

care extended to children is shown in the following table.

TABLE XX
ADMISSIONS AND DAYS OF CHILD CARE
AT SPECIAL HOSPITALS

Type of Hospital	Number	Number of Children Admitted in 1946	Total Days of Child Care
Eye, Ear, Nose, and Throat	2	650*	2,228*
Nervous and Mental.....	2	52*	10,950
Orthopedic	1	85	11,838
Convalescent	1	106*	2,190*
<hr/>			
Total, special hospitals..	6	893*	27,206*

*Estimated by hospital directors.

During the year of study, these special hospitals admitted 1.8 per cent of all children hospitalized in the state. The small number of admissions to each of these special hospitals does not necessarily imply a lack of adequate facilities in the state to care for the particular diseases they treat. On the other hand, there is no question but that the hospital facilities of Louisiana are still inadequate to care for a number of conditions to which special hospitals are ordinarily dedicated; for example, there are no separate provisions made for the care of tuberculous children, rheumatic children, or convalescents, and those for the institutional care of mentally ill or retarded children are still almost entirely of simple custodial nature. Incidentally, only 32 nervous and mental hospitals were found in the entire United States which admitted children for treatment, rather than for simple custodial care.

SUMMARY

1. About 1 out of every 9 children in Louisiana was born in or admitted to the general hospitals of the state during 1946. In these hospitals, there were 11.8 total hospital beds and 1.13 specified pediatric beds per 1000 children in the population. There was an average of 5.2 child admissions for each of the general hospital beds in the state.
2. There were about 1.6 times as many child admissions to hospitals in the metro-

politan areas as in the isolated parishes. Special hospitals admitting children carry a very small but important portion of the total hospital load.

3. Eighteen of the larger general hospitals in Louisiana had special pediatric units; 9.6 per cent of all our general hospital beds were set aside for the use of children.
4. According to the number of hospital births and admissions of sick infants and children up to age 15, about 45 per cent of the total admissions to hospitals and 37 per cent of total hospital care for children was for newborns.

5. Judging by seven measurable items chosen for comparison, the quality of hospital care extended to children in Louisiana compares favorably with that for the United States generally. Twenty-nine per cent of child admissions and 40 per cent of births were in hospitals lacking certain characteristics considered desirable for good pediatric care.

CHAPTER VII.

CONCLUSIONS AND RECOMMENDATIONS

It has been stated previously that this study of Child Health Services in Louisiana is a part of the first nationwide attempt by physicians themselves to analyze the quantity of medical care available to children. It does not attempt to answer the question as to what constitutes adequate or optimal care—too few yardsticks are available. Our aim now is to assure the best care possible; recommendations based on this study should indicate channels through which such care may be provided.

Although the study was limited to health aspects of child care, it has been pointed out that many economic, sociologic, and educational factors affect child health directly; hence sustained improvement in the health and welfare of our children must depend on cooperative effort in many fields of endeavor. No attempt has been made to paint the picture in somber tones, but rather to present things as they are—factual and comparative data as a basis for

future planning. As a matter of fact, in some respects Louisiana compared favorably with surrounding states, as for example, improvement of infant mortality, percentage of babies born in hospitals, and hospital beds available for children.

I. CHILD HEALTH COUNCIL

The cooperation of many organizations and individuals has made this study possible. Continued cooperation should develop a coordinated, long range program of child health improvement. For this purpose, it is recommended that a Child Health Council be established, with representation from the State Medical Society, State Dental Association, State Pediatric Society, Rural Health Council, Tulane and Louisiana State University Medical Schools, Academy of General Practice, State Department of Health and its section on Maternal and Child Health, Women's Auxiliary to the State Medical Association, State Tuberculosis Association, National Foundation for Infantile Paralysis, the State Departments of Education and Public Welfare, the State Hospital Planning Commission, the Louisiana Conference of Social Welfare, the P.T.A., American Legion, and any other organizations directly interested in the health and welfare of children. Financial aid should be provided to support a full time secretary functioning to secure systematic and sustained effort.

II. DISTRIBUTION OF MEDICAL CARE

A marked disproportion existed between the number of children per physician and dentist in rural parishes as compared with metropolitan parishes. Though some improvements have undoubtedly occurred during the past two years,²³ the needs of rural and semirural parishes are still obvious; 60 per cent of the child population of our state resides in these parishes. A Rural Health Council has already been established by the American Medical Association and the Louisiana State Medical Society and has been working for some time on the problem

of attracting physicians to rural areas. It is recommended that the proposed Child Health Council work closely with this group, in developing an active program of enlisting physicians for areas of need.

Construction of new hospitals in these areas will afford the incentive of better clinical and laboratory facilities for future practitioners. Consideration should be given to other plans, such as a program of education for rural needs and opportunities, conducted by medical societies and medical schools. The encouragement of local communities to attract good physicians and dentists by affording adequate working and living facilities and financial support is desirable. Extension of public health facilities is to be considered. Subsidies to physicians with training in pediatrics would attract both general practitioners and pediatricians to settle in areas of need (either direct subsidies or educational subsidies as provided by various foundations).

Careful study of these and other plans should lead to a choice which is best suited to local needs and opportunities, but it is recommended that, insofar as possible, these problems be solved within the framework of the private practice of medicine.

III. GRADUATE AND POSTGRADUATE PEDIATRIC TRAINING

Inasmuch as general practitioners furnish most of the medical care for children in our state, programs for postgraduate education in care and supervision of children should be expanded. Louisiana State University Medical School and the State Board of Health are cooperating in conducting traveling refresher courses in selected areas. Tulane Medical School, through its division of postgraduate medical education, conducts a number of intramural refresher courses for general practitioners and pediatricians each year. These are not yet adequate to meet the goal of *continuing* pediatric education of all physicians who treat children. Further financial support is necessary for these as well as undergraduate programs of education in pediatrics. Recognizing the financial

²³Since the study was made in 1946, 12 qualified pediatricians have located in isolated semirural and rural parishes, improving the distribution markedly.

emergency in most medical schools, the American Medical Association is sponsoring a nationwide foundation for support of medical education; this program deserves the enthusiastic cooperation of all physicians in Louisiana.

It is recommended that those physicians who participate in community health services related to children, such as school health programs, well baby and preschool clinics, be encouraged and eventually required to have some training in care of children. Toward this end the State Board of Health should cooperate with medical schools in arranging for scholarships and assisting physicians to secure proper training.

It is recommended that a review of current pediatric literature useful to the practicing physician be arranged cooperatively by the Louisiana State Pediatric Society and the New Orleans Medical and Surgical Journal.

IV. HEALTH SUPERVISION AND COMMUNITY HEALTH SERVICES

Serious gaps have been shown to exist in the proportion of children under health supervision. The Child Health Council should consider methods of supporting the parent education program carried on by the State Department of Health in order to increase the number of parents who will seek such care from their own physicians. This aim will also be furthered by extension of school health services to all schools in the state and by raising the standards and quality of these services. A large increase in the corps of public health nurses is essential to both of these developments as well as to the extension of Child Health Conferences.

Considerable extension of child health conferences must be planned to serve those who have no physician. Location, frequency, and size of those conferences should be determined on the basis of local conditions and needs. Rural areas, where services are least available, and general medical services also scarce, deserve first attention. Louisiana's unfavorable record in regard to certain preventable diseases points up the need for intensive efforts to assure ade-

quate immunization of every child against these diseases.

Child health closely parallels the general state of public health activities in a community. Health units should be established in all parishes which do not have this service. Increased inducements to attract competent physicians to take posts as parish health officers are basic to success in local health work. Integration of health centers with new hospital construction under the Hill-Burton act is a logical development to be fostered.

SPECIAL SERVICES

Development of services for crippled children in Louisiana can serve as a model for extension of similar service to the "medically crippled" such as cardiacs, chronic nephritics, and severe asthmatics.

The need for convalescent homes is particularly serious. The recently established school for spastic children in Alexandria serves a definite need, but is only a start. Establishment of institutions for custodial and remedial care of mentally deficient or retarded children and expansion of real mental hygiene programs are other problems which challenge intelligent planning in the field of Community Health Services. A well rounded rheumatic fever program, including provision for case finding, consultative diagnostic facilities and resources for placement, should be instituted at the earliest possible moment.

V. HOSPITALS

While the situation in Louisiana as to hospital beds for children appears favorable—due largely to regional charity hospital allocations—deficiencies in quality and distribution of hospital facilities have been documented by this Study. To correct these, it is recommended that the proposed Child Health Council and State Pediatric Society make all pertinent detailed data that we have collected available to any qualified individual or group interested in new hospital construction, remodeling, or otherwise improving existing facilities in any part of our state.

An affiliate-hospital program, with improved staff meetings, demonstrations, and

exchange of house officers, would bring to outlying hospitals continuing instruction and adjunct services from larger teaching hospitals and the medical schools. In this way, the quality of care rendered in smaller hospitals might be improved, and personnel from the larger medical centers might gain better insight into the problems and limitations continually imposed on their colleagues in the field. Provision should be made for adequate statewide consultation services, and for inclusion of a pediatrician's services for each hospital admitting children.

The proposed Council might well concern itself with the problem of reviewing and revising regulations and policies concerning requirements to be met by hospitals admitting children, facilities, and technics concerned with care of premature infants and of children with certain communicable or chronic diseases.

Inclusion of more adequate laboratory services and arrangements for hospitalizing infants and children in new hospitals should do much to attract well trained younger men to rural areas. Close and continuing cooperation of the Child Health Council and the Rural Health Council will be necessary to work out the most pressing problems concerned with better and more equitable distribution of hospital services in rural areas.

VI. PROGRAM FOR PREMATURE INFANTS

Remarkable progress in this field has been made in many states and Louisiana is fortunate in that an extensive program has already been started centering around the newly enlarged premature unit in Charity Hospital at New Orleans. This unit will act as a training and demonstra-

tion center under the joint sponsorship of the State Department of Health, the Hospital, and the two medical schools. General cooperation throughout the state and development of other units will be necessary to be sure that all premature infants benefit from such special care. Improvement in safe transportation technics is an important step.

VII. DENTAL HEALTH SERVICES

As noted in the body of this report, certain deficiencies in dental care have come to our attention, similar to the medical findings in extent and degree.

As a result of the cooperation and interest of the Louisiana State Dental Society and their committee on improvement of dental health, these findings will be reported in further detail by the Dental Society and recommendations leading to a program of improvement will be developed by this organization.

The Child Health Council should make available all pertinent information concerning dental care to the dental organizations and should assist in every way possible in the development of their program.

Physicians, together with all other professional personnel directly concerned with the care of children, should assume leadership in planning for needed improvements based on this study. Citizens of the state, through elected leaders and through community planning, must assume responsibility for carrying out these improvements. Neither doctors nor hospitals rise much above the level of their communities; statewide interest and cooperation of each local community must be secured if these plans are to succeed. If this study is found useful as a basis for planning, it will have served its purpose.

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PEDIATRIC ISSUE OF THE JOURNAL

In this issue of the Journal the scientific material is in the field of pediatrics. The papers delivered in this section at the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, together with certain others, were grouped by the Editorial Committee of the Louisiana State Pediatric Society for publication. The range of interest covered by these articles is considerable, and the facts presented will serve the general practitioner as well as the specialist.

In a certain sense the practice of the diseases of children is a cross section of

general medicine with certain intensifications. The latter are in good part the result of the circumstance that infections set upon the child host before immunity defenses have had a chance to develop, and the other circumstance that degenerative diseases are usually not present.

The general practitioner can well profit by these considerations and these articles on general medicine from the pediatric point of view.

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THE LOUISIANA STUDY OF CHILD HEALTH SERVICES

In this issue of the Journal is published the final installment of the Louisiana Study of Child Health Services. This is part of a nationwide study undertaken in the past three years under the direction of the American Academy of Pediatrics. Other installments have appeared in issues of the two previous months.

The study relates principally to the year 1946. This investigation is a comparative one in which the services and facilities of the state are viewed in the light of the national or sectional average. No effort is made to state what constitutes adequate or optimal care. The report is in six chapters of analytical data, with one additional for conclusions and recommendations. Certain facts gleaned from the report give cause for reflection.

The state's death rate during 1940 was the fourth highest in the nation. However, during the period 1933 to 1946 improvement occurred. The rate was 70.1 in 1933, and 37.2 per thousand in 1946. This is to be compared with a national average of 33.8. Children in Louisiana received about four-fifths as much medical care as the national average, as gauged by the number of children seen by doctors on a single day. On an average day in Louisiana, 3.15 of every 1000 preschool children received health supervision; this rate was one-third less than that for the United States generally. Physicians in private practice rendered more than 90 per cent of this service.

Louisiana had 32 per cent more children per physician than the national average.

Seventy per cent of the medical care extended to children was furnished by general practitioners. For each of the 57 pediatricians there were 13,612 children—compared with the national average of 10,299. Community health services in Louisiana were somewhat less than the national average.

Louisiana compares favorably with the surrounding states in the percentage of babies born in hospitals and the hospital beds available for children.

In evaluating the position we hold in these several comparisons, inquiry must be made into the educational and economic condition of the state. The report states that income per capita in Louisiana for the period 1944-46 was \$811. Another figure from the Bureau of Governmental Research for the year 1946 was \$784. This puts Louisiana sixth from the bottom. The same source reports that the State tax (excluding local taxes) revenue in 1947 was \$50.07 per capita, or eighth from the top. In 1940, (the most recent date available) we had the highest percentage of illiteracy. Our state then is sixth from the bottom in income, eighth from the top in taxes, and at the bottom in literacy. In the various categories in which child health care was studied the state was near the average in the majority of instances, and in two instances better than the average. In view of these facts, the medical profession has good cause to congratulate those who care for children on an excellent result in the face of obvious difficulties.

Medical progress has been built on the efforts of generations of physicians. The recommendations at the conclusion of the report are laudable in their aim. However, the method suggested for their operation may not appeal to the physician who will probably continue to do most of the care of children—the general practitioner.

THE SURGICAL ASSOCIATION OF LOUISIANA

On November 11, 1948, surgeons of this state held an organization meeting and adopted a constitution and by-laws for the

Surgical Association of Louisiana.

Preliminary efforts over the past year were directed towards forming a nucleus of general surgeons living in New Orleans, who were not members of specialty societies within the field of surgery. Dr. Roy B. Harrison was president. When this group was expanded to include members over the state Dr. C. Grenes Cole was elected president, and Dr. Henry G. Butker, secretary.

The stated purpose is to foster surgical knowledge; to aid surgical advance of the hospitals; to promote and maintain harmonious moral and ethical standards among the members. The only paper was that of Dr. Urban Maes on "A Plea for Better Clinical Diagnosis in the Field of Medicine." The attention of the group was on the clinical and on the altruistic phases of the surgical field. The Surgical Association of Louisiana has been launched auspiciously and the founders are to be congratulated.

The various surgical specialties have statewide organizations which have served well the purpose of coordinating the efforts of their members. It is timely that now the general surgeons have an organ which will give a focus to their individual efforts in maintaining the high standards of surgery and serve as a mouthpiece for this most substantial and definitive part of medicine. Organized medicine faces a greater threat now than ever in the past. On the one hand it is beset by a world in which ethical standards suffer materialistic attrition; on the other, by the communistic trend toward state medicine. The recent presidential campaign and election give proof to the gravity of the situation.

This compact surgical body will have the opportunity to help dissipate the apathy with which the approaching crisis is viewed, and to serve its stated objective in the process.

CORRECTION

In the October issue in the article "The Application of Fundamental Knowledge to

the Clinical Problem of Hypertension" the column on averages on pg. 143 should be as fourth, fifth and seventh figures in the follows: 262,286; 99,033; Total 2,012,802.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

A TRIBUTE TO THE GENERAL PRACTITIONER FOR SERVICES RENDERED



Dr. Charles Manly Horton, of Franklin, has been selected by the Louisiana State Medical Society as the outstanding general practitioner of the State of Louisiana for 1948. This honor was bestowed on Dr. Horton after the component societies throughout the state sent to the office of the Society recommendations of members for this distinction and after such recommendations were acted upon by the Executive Committee of the organization. The selection was made based upon data received concerning training and type of practice which Dr. Horton has had since he started his medical course.

Dr. Horton graduated from Tulane University in 1911, after having completed a two-year resident student term at Charity Hospital, New Orleans. His first location as a general practitioner was in Guntown, Mississippi, where he served as assistant to an elderly doctor who was in poor health. Here he was required to do everything except major surgery. The nearest hospital was in Memphis, some 100 miles away and all major surgery from the community was sent there. There were approximately only 250 people in this rural community; however due to their wide distribution on many occasions a call to visit a patient resulted in 20 or more miles on horseback. Dr. Horton had no automobile while in Guntown and all calls were made by driving or riding a horse.

After serving the community of Guntown for some months he decided to go to Franklin for a "short stay". Here he established a practice which he has found it impossible to leave and has remained for thirty-seven years. The experiences which he has had in this locality have been many and varied. In his early practice conditions of travel travel were similar to those in Guntown. The mud roads were often impassable and many calls were made by boat on the bayou. His first car—a model T Ford—many times had to be towed out of a mud-hole by mule or horse obtained from a farmer nearby. Of course, when a baby was to be delivered, the doctor, after making a visit to ascertain the condition of the patient, had to remain until delivery took place due to the hardship of travel.

Dr. Horton has grown with his present community and now is one of the busiest doctors in the town. His practice is still

of a general nature and he treats all types of cases except those needing the services of a specialist, which cases he refers to other doctors in the town or in nearby communities. Many of his obstetrical cases are still delivered in the home. He covers practically the same territory now which he covered thirty-seven years ago. He states, however, "with the improvement of highways and the advent of automobiles, the life of the country doctor has become more pleasant and more efficient."

It is felt that this is an honor well deserved by Dr. Horton. He has been recommended to the Board of Trustees of the American Medical Association for national recognition. If he is selected by the Board as one of the three physicians to be recommended to the House of Delegates of the A. M. A., his name will be included on the ballot voted upon by members of the House at the interim meeting to be held in St. Louis November 30-December 3. We wish for him this honor also.

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MESSAGE FROM THE PRESIDENT OF THE STATE SOCIETY

The election of Mr. Harry Truman as President of the United States for the coming four years has placed the medical care of the American people squarely in politics. For a number of years compulsory health insurance or socialized medicine has been banged about the halls and committee rooms of Congress by politicians and social planners, but thus far has made no serious threat of passage. Always the more conservative and, we might say, more thoughtful of the congressmen have turned it down. True, the measure usually had the blessings of the White House in the person of Mr. Roosevelt and Mr. Truman, but they apparently had not gone all out for it.

With the coming Congress the situation will be different. Mr. Truman made compulsory health insurance or socialized medicine one of the major planks in his platform. It was dangled before the electorate as something to be given the people without cost, or at a greatly reduced cost and thus

a means of getting votes. Under such circumstances it is to be expected that a measure providing for some form of socialized medicine will be introduced into the next Congress at an early date and, more important, it will have the full blessings and active support of the President.

All of us who oppose socialization in our government and particularly the socialization of medical practice have a job cut out for us if we hope to prevent the passage of such a measure. In past years we have been successful even though the measure has continually popped up, but we must face the fact that the fight will be harder this year than ever before. There are some who feel that the fight is useless and the outcome inevitable, but we cannot accept this idea and we feel that we should fight to the last ditch. Mr. Truman won the election in the face of apparent defeat and so can we win, armed with right and sound judgment on our side.

If we are to be successful in this fight we must begin now rather than wait until Congress is in session and the measure actually introduced. There are several things that all doctors can do at the present time. First, they can individually contact their congressman, explain to him how they feel about such a measure and try to get him to oppose it.

You can be sure that these men will be approached by those favoring socialized medicine as they have been in the past so that it is up to us to make our voice heard as well.

Next, we should not miss any opportunity to inform the public as to the harmful effects of such a measure as well as to its implication in the complete socialization of this country. In order to do this, doctors must inform themselves about the bills that have been introduced in Congress and the failures that have occurred in other countries from similar measures. We should be prepared to present a clear and logical case in opposition to any such measure. It is important that our reasons for opposing such a measure shall be presented to those who apparently are its active supporters.

There is a large section of the population who think as we do, but the others and particularly the labor unions apparently think otherwise. They are the people before whom we should appear, as they are the ones who must be won over to our side. A candidate for election makes progress by winning votes from his opponent and so will we make progress by converting those who now favor some such change in medical care.

Undoubtedly we can have more influence with our own patients than anyone. It therefore behooves us to use that influence. Talk to them, explain the personal ill effects of such a measure, and above all, get them to express their opposition in a letter or other message to their congressman.

Finally, the fight against this type of legislation will cost money which must be supplied in a large part by the doctors. It is unfortunate that our government has reached such a state that doctors, or any other group of professional men should have to spend a large part of their time and money in an effort to protect their business or profession from the government. We are faced, though, with just that situation and we should not fail to contribute to those organizations or groups who are actively fighting to help preserve a free and independent medical profession.

Perhaps the most serious obstacle we can place in the path of such legislation is a public satisfied with the type of service we are rendering. The public or consumer will in the long run decide the issue and

perhaps rightly so. Such being the case we must see that they are satisfied with the goods that we sell, namely medical care. If our patients are satisfied with the type and cost of medical care they are receiving, then they will resist or oppose such legislation with us. But if they feel that medical care is not generally available and that they are being charged excessive prices for the medical care they receive, then they will favor some change such as the government will propose. Patients who have been charged one hundred dollars for a job which they think is worth only fifty will be as resentful as you would be when charged one hundred dollars for a suit of clothes which you think is worth only fifty. Whenever that happens, we lose a friend and booster and unfortunately it has happened many times in the past. People generally are willing to pay adequate fees but they resent excessive fees and will attempt by some means to curb such practice. Always remember that a satisfied customer and a satisfied patient is our best booster and our best friend.

This has all the makings of an all out fight between those who favor socialization of our government and those who oppose such a change. Ours is the first group to be attacked because of the political appeal of medical care. We must win this first big battle or inevitably we will have complete socialization of our country such as England now has. May we be saved from such a mess.

M. D. HARGROVE, M. D., President.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

RAPIDES PARISH MEDICAL SOCIETY FOUNDERS DAY FORUM

The annual Founders Day Forum, sponsored by the Rapides Parish Medical Society, will be held in Alexandria, Louisiana, January 15, 1949, at the Bentley Hotel.

Again an outstanding program has been arranged to be presented by men from Tulane Medical University and Louisiana State University. The following have accepted and will present papers:

Dr. Julius W. Davenport
Dr. Willard R. Wirth
Dr. Carl N. Wahl
Dr. Curtis H. Tyrone
Dr. W. R. Akenhead
Dr. Samuel A. Romano
Dr. E. Perry Thomas
Dr. J. K. Howles
Dr. A. Scott Hamilton, Monroe, Louisiana.

An outstanding speaker will be present at the Founders Day Banquet, which will be held that night at the Bentley Hotel. At that time the new officers of the Rapides Parish Medical Society will be introduced to the gathering. An attractive program of medical interest and of entertainment has been arranged. This Forum was one of the best attended meetings in the State last year. More than 100 participated. The invitation is extended to all members who wish to attend. The meeting has every appearance of being a most satisfactory and profitable gathering. Sessions will be held in the morning and in the afternoon, and there will be a banquet in the evening.

MEETING OF THE FOURTH DISTRICT MEDICAL SOCIETY

Research in aviation medicine was discussed at a dinner and joint meeting of the Fourth District Medical Society and the Shreveport Medical Society at Shreveport Charity Hospital on Tuesday night.

Dr. W. C. Gray of Springhill was elected president of the Fourth District Medical Society at the meeting. Retiring president is Dr. William M. Hall of Shreveport.

Capt. Ashton Graybiel, Commander C. W. Gell, and Commander M. T. Martin of the U. S. naval air station, Pensacola, flew to Shreveport to tell the physicians about recent research work at the Naval School of Aviation Medicine.

Dr. Graybiel, who is coordinator of the school, spoke of special work on hazards of night flying, heart abnormalities, and problems of breathing resulting from a disordered nervous system. He described several devices recently perfected and set in operation at the school which will provide heretofore unobtainable information regarding effects of speed, altitude, and night flying upon aviators.

Commander Gell and Commander Martin are Navy pilots in addition to being medical officers.

The Navy men were welcomed by Dr. Ralph Riggs, who served with them in World War II, Dr. M. D. Hargrove, president of the Louisiana State Medical Society, Dr. J. E. Knighton, Jr., president of the Shreveport Medical Society, and Dr. Hall.

In addition to Dr. Gray, other new officers of the Fourth District Medical Society are Dr. Robert Van Horn of Mansfield, vice president; Dr. Joseph Holoubek of Shreveport, secretary-treasurer, Dr. L. S. Huckaby of Coushatta, delegate to the state convention, and Dr. Jason C. Sanders of Shreveport, alternate delegate to the state convention.

Retiring officers are, in addition to Dr. Hall, Dr. S. M. Richardson of Minden, vice president, and Dr. Richard Brunazzi of Shreveport, secretary-treasurer.

MEETING OF THE SIXTH DISTRICT MEDICAL SOCIETY

The Sixth District Medical Society held a very fine meeting at Hammond, La., on Tuesday evening, November 16, at the Cave Tangi. In spite of the bad weather, there was a good attendance and a wonderful scientific program was presented. Dr. E. H. Countiss of New Orleans spoke on "Office Gynecology" and Dr. M. M. Bannerman of Baton Rouge presented a paper on "Emergency Treatment of Hand Injuries." The essayists were complimented on their excellent presentations and a lively discussion from the group followed.

The group also had the opportunity of hearing Dr. A. V. Friedrichs, Chairman of the Council of Medical Service and Public Relations of the Louisiana State Medical Society who gave a very interesting talk on the present and future activities of his Council. Dr. C. G. Cole gave some very valuable information on legislative matters which came up before his committee during the last session of the Legislature. Dr. Robert Sharp, Chairman of the Arrangements Committee of our 1949 Annual Meeting told of the progress of his Committee and extended to all those present an urgent invitation to attend. The group was also addressed by the Secretary-Treasurer of the State Medical Society who discussed the present and future status of medical legislation. He dwelt primarily on the importance of the medical profession taking more active steps now to prevent the enactment of such legislation. All these talks were very enthusiastically received and encouraged some very important discussion.

The Sixth District Medical Society is one of our most active district organizations and everyone at the meeting seemed to be sincerely interested in the scientific and other aspects of the program.

The next meeting of the Sixth District will be held in Baton Rouge.

MEETING OF THE ORLEANS CHAPTER OF THE AMERICAN ACADEMY OF GENERAL PRACTICE

The Orleans Chapter of the American Academy of General Practice held the regular monthly meeting Friday, October 29, at Hutchinson Memorial, Tulane University.

Dr. Eugene Countiss gave an interesting talk on "The Diagnosis and Treatment of the Most Frequent Gynecological Complaints." The membership joined in a ten minute round-table discussion of these complaints.

The next meeting will be a dinner meeting at Lenfants Boulevard Room Monday, November 29 at 8 p. m.

The speaker will be Dr. H. S. Mayerson, Professor of Physiology at Tulane University, his subject, "The Physiology of Hypertension."

THE NEW ORLEANS GRADUATE MEDICAL ASSEMBLY

The twelfth annual meeting of the New Orleans Graduate Medical Assembly will take place March 7-10, 1949, at the Municipal Auditorium. Fourteen divisions of medicine have selected eighteen distinguished guest speakers. The Assembly has been fortunate in bringing to the membership in years past physicians who were eminent in their fields. This list for the coming session is a worthy sequel and is most impressive. The guest speakers are:

Dermatology—Dr. C. Guy Lane, Boston, Massachusetts

Gastro-enterology—Dr. Albert F. R. Andreson, Brooklyn, New York

Gynecology—Dr. George H. Gardner, Chicago, Illinois.

Medicine—Dr. Russell L. Cecil, New York, New York; Dr. E. H. Ryneerson, Rochester, Minnesota; Dr. Charles A. Poindexter, New York, New York

Neurology—Dr. O. Spurgeon English, Philadelphia, Pennsylvania

Obstetrics—Dr. B. P. Watson, New York, New York

Ophthalmology—Dr. Everett L. Goar, Houston, Texas

Orthopedic Surgery—Dr. J. S. Speed, Memphis, Tennessee.

Otolaryngology—Dr. C. Stewart Nash, Rochester, New York

Pathology—Colonel J. E. Ash, Washington, D. C.

Pediatrics—Dr. A. Ashley Weech, Cincinnati, Ohio

Radiology—Dr. Frederic E. Templeton, Seattle, Washington

Surgery—Dr. Reginald Smithwick, Boston, Massachusetts; Dr. John deJ. Pemberton, Rochester, Minnesota

Urology—Dr. J. A. Campbell Colston, Baltimore, Maryland.

Invitation of President—Dr. Frank Lahey, Boston, Massachusetts.

Following the meeting a postclinical tour to Mexico is planned, March 12-27. Arrangements have been made to leave New Orleans by Pan American clipper on Saturday, March 12. Headquarters in Mexico City will be at the new Hotel del Prado. A medical program has been arranged by doctors in Mexico City for March 14-15. The itinerary includes trips to Cuernavaca, Taxco, Pueblo, Fortin, Orizaba, Oaxaca, and other points of interest. For further information write to The New Orleans Graduate Medical Assembly, Room 105, 1430 Tulane Avenue, New Orleans 12, La.

The officers of the Assembly are to be commended for arranging so inviting a meeting.

NEW MEMBERS OF THE AMERICAN COLLEGE OF SURGEONS

The American College of Surgeons at the Convocation during the Clinical Congress in Los Angeles on October 22, 1948 received 943 fellowships and seven honorary fellowships were conferred. It is reported that this is the largest class of initiates since 1914. Fifteen surgeons from Louisiana were initiated. They are:

Paul J. Azar, Lafayette

George D. B. Berkett, New Orleans

Irvin Cahen, New Orleans

Isadore Dyer, New Orleans

Ben Goldsmith, Lake Charles

John J. Hallaron, New Orleans

John S. Herring, New Orleans

John A. Holmes, New Orleans

Harry Meyer, New Orleans

Charles H. Mosely, Jr., Baton Rouge

Edward W. Nelson, New Orleans

Warren L. Rosen, New Orleans

Leonard H. Stander, Baton Rouge

Harry M. Trifon, Shreveport

Charles R. Walters, New Orleans.

EXPLANATION OF VETERANS ADMINIS- TRATION FEE SCHEDULE

During the past year the Veterans Administration has established a fee schedule which is to govern fees in the so-called "Home Town Medical Care Program for Veterans." In this connection the Veterans Administration has asked that a letter of explanation be published in the various medical organization journals. The Journal of the A.M.A. published it in the May 22, 1948 issue. The Branch Medical Director, Dr. Lee D. Cady, has requested that the letter be again published in this journal in order that the entire membership may be informed as to the status and method of

procedure in arriving at the fee schedule. The letter follows:

"Dr. Morris Fishbein
Editor, The Journal of the
American Medical Association
535 North Dearborn Street
Chicago, Illinois

Dear Dr. Fishbein:

"It has come to my attention that considerable misunderstanding has developed throughout the medical profession concerning the establishment of fees for medical services to be paid private physicians participating in the so-called 'Home Town Medical Care Program for Veterans.' It has been contended that the Veterans Administration has arbitrarily established a Fee Schedule which represents the maximum amount which may be paid for any given service and which is, in effect, a National Fee Schedule. It has also been contended that the various State Medical Societies and other interested groups were not consulted when this Fee Schedule was adopted.

"In order to clear up any misunderstanding regarding this matter, it is desired to emphasize that my predecessor, Dr. Paul R. Hawley, had no intention at any time of establishing a National Schedule of Fees, nor do I contemplate doing so. However, the Fee Schedules originally submitted by the various State Medical Societies, when the 'Home Town Medical Care Program' was inaugurated, varied so widely in format, terminology, and fees for similar or identical services, that it was deemed advisable to establish a uniform Fee Schedule Format and to set up tentative fees which could be used as a guide by the various State Medical Societies when submitting their proposals for the furnishing of medical care to veterans.

"This uniform Fee Schedule Format was formulated by the Professional Group of National Consultants to the Chief Medical Director. This Group, representing the various specialties in medicine and surgery, is composed of eminent physicians from all parts of the country. Tentative fees were set up in the format after a careful analysis of Pre-Paid Medical Care Plan, Workmen's Compensation and Insurance Fee Schedules, and also the Fee Schedules in effect in the various States having agreements with the Veterans Administration. As was to be expected, considerable variation occurred in the Fee Schedules reviewed. The Professional Group of National Consultants made every effort to arrive at fees that were considered to be within reasonable limits and which would, as nearly as possible, allow a uniform provisional fee schedule for use as a guide in facilitating and expediting the preparation of agreements between Station Medical Societies and the Veterans Administration.

"Further attempt was made to provide for elasticity in the charges for certain operations or

other services which seemed to evoke more than average contention by listing the minimum and maximum amounts considered equitable. These items bear the notation 'AA', which indicates that the fee for the given service is to be determined by arbitration and agreement between the Veterans Administration and the Medical Society concerned.

"May I reiterate that the Veterans Administration Fee Schedule Format is in no sense to be construed as an arbitrary or National Fee Schedule. Furthermore, it is subject to periodic review and such modification as conditions may indicate.

"If it meets with your approval, I would appreciate it very much if you could possibly arrange to publish this as an open letter in the Journal of the American Medical Association. I should like this to reach all of the physicians throughout the country, and I know of no better way to do it than through the Journal.

"Very truly yours,
(Signed) PAUL B. MAGNUSON
Chief Medical Director"

POSTGRADUATE COURSE IN ENDOCRINOLOGY

The Postgraduate Committee of The Association for the Study of Internal Secretions, under authority of its Council, announces a course of lectures and demonstrations in clinical endocrinology to be held in Oklahoma City at the Skirvin Hotel, February 21 to 26, 1949, inclusive.

The faculty will consist of prominent investigators and clinical endocrinologists in the various branches of the medical sciences, gathered from the United States and Canada.

This course will be a practical one of interest and value to both the general practitioner and the specialist.

A fee of \$100 will be charged for the entire course and the attendance will be limited to 100. Registration will be in order of checks received. Should there be an insufficient number of applicants to warrant the course, the registration fee will be immediately refunded in full.

Please forward application on your letterhead, together with check payable to The Association for the Study of Internal Secretions, to Henry H. Turner, M. D., Chairman of the Postgraduate Committee, 1200 North Walker Street, Oklahoma City 3, Oklahoma.

Due to other meetings being held in Oklahoma City at the time of this assembly, satisfactory hotel accommodations will be difficult to procure on short notice; therefore, it is suggested that applicants make their reservations EARLY, directly with hotels of their choice. Some of the better downtown hotels in Oklahoma City, listed according to their proximity to the Skirvin, are: Skirvin Tower, Huckins, Wells-Roberts, Biltmore and Black.

BOOK REVIEWS

Practical Bacteriology, Hematology, and Parasitology: By E. R. Stitt, Paul W. Clough, Sara E. Branham and contributors. 10th ed. Philadelphia and Toronto, The Blakiston Co., 1948. Pp. 991. Price, \$10.00.

Like an oak this reference book has grown from a small but vigorous seedling (first edition, 1909) to a sturdy tree having branches which embrace the area of the modern clinical laboratory. As the title suggests, the volume encompasses the three main subjects involved in the laboratory diagnosis of disease, namely bacteriology, hematology and animal parasitology, while a fourth section considers diagnosis from an anatomical standpoint.

Part I (Bacteriology) includes a chapter on basic principles in bacteriology, then proceeds to consider the morphologic and cultural diagnostic characteristics of the cocci, spore-bearing bacilli, gram-positive and gram-negative bacilli, spirochetes, rickettsias, filtrable viruses and pathogenic fungi. The remaining chapters on immunity, media and reagents, and staining methods and special procedures complete Part I. In the opinion of the reviewer these subjects are well-balanced, modern in their presentation and clearly presented. This portion of the volume requires 373 pages of text, and contains excellent photographs, particularly good in illustrating the fungi, and one color plate on bacteria (facing page 90).

Part II (Hematology) is presented in three chapters and slightly less than one hundred pages. There are three excellent color plates. While this portion of the book may seem somewhat skimpy to the professional hematologist, it includes all of the material essential for a diagnosis of the diseases of the blood and blood-forming tissues, as well as the standard criteria for interpreting other disease processes through a study of blood cells and plasma.

Part III (Parasitology) is the most authoritative and comprehensive one on the subject found in any text of clinical laboratory medicine. The reviewer, whose special field is presented in this part of the book, has been particularly careful to look for out-dated information, inaccuracy in statement

and interpretation, and inconsistency in nomenclature. No such errors have been encountered. The information is accurate, up-to-date and well handled, whether it be in intestinal protozoölogy, malaria, the leishmaniasis, trypanosomiasis, helminthic infections of the intestine or elsewhere in the body, and arthropods, other invertebrates or vertebrates as causative agents and carriers of disease. This portion of the text requires fourteen chapters and 252 pages. It is abundantly illustrated. There are two good color plates illustrating the malaria parasites.

Part IV (Clinical and Pathologic Examination of the Various Body Fluids and Organs) will appeal particularly to the clinician who desires concise, comprehensive information on what to expect and how to make diagnosis from material obtained from the patient or at necropsy. The convenient presentation of this mass of information by anatomic source serves as a useful cross reference to the other sections of the book where the data are assembled etiologically.

In addition, there is an Appendix, describing apparatus and its use, tables of standard values, anatomic and physiologic norms, injuries caused by toxic plants, and standard laboratory procedures for diagnosis of diseases indexed alphabetically by diseases. There is a comprehensive subject index, but regrettably there is no author index and relatively few source references are cited in the body of the text. (A single exception occurs at the end of Chapter 44, Vitamins as Specific Food Factors, with a brief bibliography on pages 906-907.)

The volume is beautifully printed and attractively bound. It should be available for immediate reference in the office and laboratory of every physician.

ERNEST CARROLL FAUST, PH. D.

Human Physiology: By F. R. Winton, M. D., D. Sc. and L. E. Bayliss, Ph. D. Philadelphia, The Blakiston Company, 1948. Pp. 592. Price, \$7.00.

This is the third edition of a text by the same authors, which was first published in 1930. In

their preface to the first edition, the authors indicated their desire of having a text book which would stimulate the medical student to know less and think more. Accordingly material was omitted rather than compressed and the result was a very interesting and somewhat unusual approach. The new edition follows this same pattern. The text has been kept small while still including a considerable amount of information. Many of the chapters have been revised and some rewritten. The style and arrangement of the material are good and the student will have little difficulty in grasping the concepts which the authors are suggesting. Many of the newer methods of studying physiological processes are given and references are made to recent advances in the various fields. The only criticism which the reviewer has to make is the small amount of space given to the discussion of circulation. From a practical point of view, the medical student will be called upon to display a rather detailed knowledge of circulation after he leaves his course in physiology. Much of his work during his clinical years will be concerned with diseases of the circulatory, respiratory and excretory systems. It would seem, therefore, that in a volume of almost 600 pages, more than 60 pages should be devoted to the study of heart and circulation and, in this particular volume, less space might have been used to discuss the nervous system. On the whole, however, the text can be recommended to the medical student and physician as an excellent text which is shorter and easier to read than some of the more complete texts on human physiology which are now available.

H. S. MAYERSON, PH. D.

The Hospital Care of Neurosurgical Patients: By Wallace B. Hamby, M. D., F. A. C. S. Springfield, Ill., Charles C. Thomas, 1948. Pp. 156 illus. Price, \$3.00.

The first edition (1940) of this handbook which Hamby wrote for internes and nurses apparently found a wide appeal among practitioners. Perhaps the author had forgotten how completely neurosurgery is unlike general surgery. This second edition, however, has retained the appealing simplicity of the first one. This handbook contains information not only about the care of the neurosurgical patient who might fall into the general

surgeon's hands but it also affords some idea of the nature of the neurosurgical treatment to be offered the general surgeon's patients when they are referred to a neurosurgeon. This alone makes the book worthwhile to the practitioner not doing neurosurgery.

Four new topics have been added: Relations of the House Officer, Cerebral Arteriography, Ventricular Decompression and Prefrontal Lobotomy. The discourse on relations of the house officer, which is quoted directly from Crile and Shively's "Hospital Care of the Surgical Patient," is an unfortunate addition to an otherwise clear-cut compendium. Even if it were good it has no place in the handbook. The remarks about prefrontal lobotomy are pertinent, clear and comprehensive, indeed, bearing the mark of Walter Freeman to whom proper credit has been given. Sodium pentothal is considered the anesthetic of choice in carotid arteriography and the endotracheal tube the safest method, especially with a team unaccustomed to this procedure.

Of convenient size and adequately illustrated with uniform line drawings, this handbook is recommended for any medical office or hospital library.

FREDERICK C. REHFELDT, M. D.

Handbook of Ophthalmology: By Everett L. Goar, A. B., M. D., F. A. C. S. St. Louis, The C. V. Mosby Company, 1948. Pp. 166. Price, \$5.50.

This handbook of ophthalmology was prepared (originally in looseleaf form) for his own students by the Professor of Ophthalmology at the Baylor University College of Medicine, with the laudable purpose of making ophthalmology a little simpler for the junior medical student, who, says the author sympathetically in his preface, already "has some twelve other subjects to be concerned about."

The book admirably fulfills the author's purpose. It is an excellent text for a beginner who has just been exposed to anatomy and physiology and who is likely to be overwhelmed by the mass of material in the larger standard texts. It is also a useful book for the general practitioner to have at hand for ready reference.

The eighteen chapters which make up the text deal in brief but remarkably comprehensive fashion with the history of ophthalmology; the anatomy, embryology and physiology of the eye; methods of examination, including the use of the ophthalmoscope; refraction and lenses; and the possible diseases and anomalies of the various anatomic structures of the eye. There are special chapters on glaucoma, intraocular tumors, and strabismus, a chapter on the eye in general disease, and a concluding chapter on injuries of the eye, first aid, and ocular therapeutics.

The book is well organized and clearly presented and has the great advantage of being small. The majority of the illustrations are borrowed from other texts, which is a commendable method of keeping costs down.

Almost the only adverse comment one might make on the book has to do with the index. It is suggested that when the next edition is published—the merits of the text suggest that this should be in the not too distant future—the index might profitably be re-examined. It could be more complete as well as more illuminating. To illustrate: The item crystalline lens (listed only as lens) is followed by the listing of development anomalies, cataracts and dislocations. But the term crystalline lens is also listed as such, the page references in this listing dealing with the anatomy of the structure as well as with the general section on the subject. Finally the term appears again under the listing of (trial) lenses, where it assuredly does not belong.

These are, however, minor criticisms of a book of major excellence.

WILLIAM B. CLARK, M. D.

Principles Governing Eye Operating Room Procedures: By Emma I. Clevenger, R. N. St. Louis, The C. V. Mosby Company, 1948. Pp. 215. Price, \$5.50.

This is a book which deserves a hearty welcome. There has been a place for it for a long time. It should prove of use to supervisors of eye operating rooms in specialty hospitals, particularly those who are somewhat new to their tasks. It should prove of even greater use to operating room supervisors

in general hospitals in which operations on the eye are not performed often enough to permit familiarity with the ophthalmic surgeon's needs to be achieved.

Miss Clevenger's position as supervisor of the eye operating room in the New York Eye and Ear Infirmary, which is one of the largest and best specialty hospitals in the country, has furnished her with ample opportunities to observe the work of the most competent ophthalmic surgeons in the country, as one of the best of them, Dr. Conrad Berens, notes in his foreword. The book is thus an epitome of the author's own wide experience and of the practices of this special hospital, practices which might well be emulated everywhere.

It would be hard to mention any necessity of the eye operating room which is not listed in this book or any surgical procedure on the eye which is not provided for. The numerous illustrations (which would be improved by being given numbers, to permit cross reference) are informative and generally excellent.

This is a book, on the other hand, which would be greatly improved by drastic editing. The presentation of the material is not entirely logical; special instruments, for instance, are listed and described before the basic operating room equipment is mentioned. Space and words are both wasted. In the section on the care and handling of eye instruments, for instance, the paragraphs headed, respectively, "Methods of Sterilization" and "Care (Sterilizing)" deal with precisely the same matters and the presentation would be clearer and more forceful, as well as considerably shorter, if they were combined. Quotation marks are used unnecessarily and irritatingly. Such terms as clean, contaminated, emergency table and scrub up are fully accepted medical terms, while such words as electrode and keratome in quotation marks merely distract the reader's attention. It is hard to see, furthermore, how such captions—they are numerous—as "Eye specula illustrated" and "Knives illustrated" could have escaped editorial pruning.

One other adverse criticism might also be made: The text states that the interne who secures the history and examines the patient marks the eye to be operated on with a cross of brilliant green or methylene blue, which is, of course, correct. But

there is no mention of any check of the correctness of the mark in the operating room, though this precaution should surely never be omitted in view of the unspeakable tragedy which could follow operation on the wrong eye.

These criticisms all concern readily correctible matters. In spite of them, this is an excellent book, which deserves wide circulation and which will undoubtedly prove of great usefulness in operating rooms throughout the country.

WILLIAM B. CLARK, M. D.

Hemostatic Agents: By Walter H. Seegers, M. S., Ph. D. & Elwood A. Sharp, M. D., Sc. D. Springfield, Illinois, Charles C. Thomas, 1948. Pp. 131. Price, \$4.50.

Of interest both to the clinicians and preclinical scientists this review is concerned essentially with recent developments in the field of blood coagulation and hemostatic agents. In the first chapter the mechanism of blood clotting is discussed with special reference to the roles played by thromboplastin, prothrombin, calcium, thrombin, fibrinogen, vitamin K and heparin. This is supplemented by a consideration of other factors concerned in the coagulation process such as antithrombin and fibrinolysins. The reactions between these principles are clearly illustrated diagrammatically. It is pointed out that in the complex system of interactions involved in the clotting of blood only certain factors can coexist in plasma. "These are prothrombin, fibrinogen, antithrombin, fibrinolysin inhibitor, profibrinolysin and calcium. Others such as thromboplastin, heparin and profibrinolysin activator need to be supplied in a special manner by the living organism."

The remainder of the book is concerned with hemostatic agents available for clinical use. Thrombin, fibrinogen and oxidized cellulose are discussed at length with fibrin foam and gelatin sponge receiving briefer treatment. In several instances the application of these preparations in specific operative procedures such as prostatectomy, pilolithotomy, skin grafting, etc., is described in detail. They have undoubtedly gained an important place in general and specialized surgery. Available information is also given on the physical and chemical properties of these agents.

The text is supplemented with illustrations, graphs, tables, and a bibliography of 370 references.

RALPH G. SMITH, M. D.

Correlative Neuroanatomy: By J. J. McDonald, M.S., M.Sc.D., M.D.; J. G. Chusid, A.B., M.D.; J. Lange, M.S., M.D. 4th Ed. Rev. Palo Alto, Calif. Univ. Med. Pub., 1948. Pp. 156. Illus. Price \$3.00.

The wealth of easily available information contained in the loose-leaf pages of this small volume is truly amazing. The authors have used the outline form to correlate in each of the three sections the significant findings of neuroanatomists, neurophysiologists and clinical neurologists. A listing of headings appearing under one of the cranial nerves will illustrate the correlation: gross anatomy, motor and sensory components and their peripheral and central connections, conditions affecting the nerve, symptoms of involvement, syndromes, tests and references. The diagrams of each of the cranial and spinal nerves and their plexus relations (Sec. I) alone are worth the price of the book.

Section II, entitled "Principles of Neurodiagnosis," covers not only the anatomy and physiology of the spinal cord and brain but also the subjects of motion, sensation, reflexes, trophic changes, cerebrospinal fluid, intracranial pneumography, electroencephalography and electrical examination.

In section III, under the heading of diseases of the central nervous system, are covered such subjects as congenital defects, vascular defects, infections, trauma, tumors and degenerative diseases of the central nervous system, and epilepsy.

The outline is concluded with listings of muscular dystrophies and atrophies, neurological signs and syndromes and an outline to follow in making the neurological examination.

This edition contains several new illustrations which add to its value. The section on electroencephalography with typical tracings is new, and Section III has been rewritten and enlarged.

THEODORE SNOOK, Ph. D.

A-B-C's of Sulfonamide and Antibiotic Therapy: By Perrin H. Long, M. D., F. R. C. P. Philadel-

phia, W. B. Saunders Company, 1948. Pp. 231. Price, \$3.50.

The author of this book is a recognized authority in the field of sulfonamide and antibiotic therapy. His investigations have contributed materially to our knowledge of the proper clinical use and pharmacology of these drugs and date from the earliest introduction of the sulfonamides in this country. He has presented a concise coverage of the pharmacology and therapeutic application of the sulfonamides, penicillin, streptomycin and tyrothricin. Some of the newer antibiotics still in the experimental stage are not included.

The first section outlines established dosage schedules where such exist, preparation of solutions, practical clinical pharmacology, toxic manifestations and various hints which contribute to the successful use of these agents. In the remainder of the book well over one hundred pathologic conditions in alphabetic order are discussed briefly under the headings, etiology, specific therapy, auxiliary therapy and comment. In the greater number of these conditions the above drugs are of value either as specific or auxiliary therapy. Some diseases are included for which they are occasionally used, but in the opinion of the author without justification. A conservative attitude regarding indications for therapy is evident throughout. Especially noteworthy in this regard is the strong stand taken against the topical application of sulfonamide and penicillin preparations due to the danger of sensitization. Furthermore it is stressed that "the proper evaluation of alleged or real manifestations of toxicity is one of the important phases of the intelligent use of these compounds." The dangers of the toxic reaction must be weighed against those of the infection and after consideration of possible alternatives of therapy a decision must be made.

The practicing physician will find this an extremely useful reference book sufficiently brief to be consulted within a few minutes and small enough to be carried in his coat pocket.

RALPH G. SMITH, M. D.

Intracranial Tumors: By Percival Bailey, Springfield, Ill., Charles C. Thomas, 1948. Pp. 478, Illus. Price \$10.50.

In the second edition of this now famous book

many errors of the first (1933) edition have been corrected and some new facts and an atlas of roentgenologic photographs have been added. The photographs are splendid reproductions of roentgenograms of the skull, offering a wide span of cranial and intracranial pathologic conditions. The arteriograms are especially worthwhile.

To praise this book would only be dull repetition. Yet it is believed that too many physicians, regardless of their special interest, are unaware of the vast store of information (anatomy, physiology, pathology and clinical) which it offers. The manner of presentation hydrates a too often desiccated subject. The plan of presentation is clinical, practical and authentic. This book is recommended without reservation to anyone interested in medicine.

FREDERICK C. REHFELDT, M. D.

Treatment of Heart Disease: By William A. Brams, M.S., M.D., Ph.D., Philadelphia, W. B. Saunders Co. 1948. Pp. 195. Illus. Price \$3.50.

This monograph is written as a guide in the treatment of heart disease. It is based principally on the author's own experience, however, there are six pages of bibliography. Diagnosis and methods of examination are not gone into, neither is there any extensive discussion of the variations in treatment that might arise in a given case. He believes that if the physician is familiar with the pharmacologic action of drugs used in the treatment of heart disease and its complications he will be able to meet these variations.

The first chapter is devoted to a discussion of the drugs used in the treatment of heart disease. The discussion of the pharmacologic effect of digitalis and its use at the bedside seems to be sound and conservative. The reader is reminded of the possibility of toxic manifestations of small doses of digitalis in the presence of severe myocardial disease. This is some times overlooked. His advice not to reduce the heart rate below 70 or 80 beats per minute when the myocardium is badly damaged by disease, thereby leading to extensive filling of the heart which would be undesirable under these circumstances, is sound and reasonable.

He considers the standard preparations of digitalis which are generally used to be pills or capsules containing the powdered leaf or the tincture. He thinks the physician should become thoroughly familiar with a given brand of these preparations. It might be said that the tincture could be discarded with very little inconvenience. The reviewer has felt for a long time that it is very important that the physician familiarize himself with one or two brands of pills or capsules of the whole leaf of digitalis and not to be constantly changing from one preparation to another. It is also necessary that he know one preparation suitable for intravenous administration for use in emergencies. There has been a recent report of thirty cases of digitoxin poisoning observed by one man in thirteen months, proving again the lack of understanding of the use of the different preparations of digitalis.

Under dosage of digitalis he divided patients into those of moderate cardiac failure, severe cardiac failure, and very severe cardiac failure. The amount and the time over which it is given varies in these three types of patients. The drug should be given by mouth, unless some definite reason exists for the use of a different route.

The use of digitalis is recommended as a diagnostic and prognostic aid. The reviewer has the impression that physicians generally are not familiar with this side of digitalis therapy. There is a short discussion of other digitalis-like drugs and mercurial diuretics. The author seems to have little faith in the use of xanthines in the treatment of coronary disease and advises if one wishes to continue this ritual he should at least choose a preparation which is not likely to induce gastrointestinal upset. He thinks theobromine calcium salicylate is probably best. There are many who share this same opinion.

He considers quinidine an effective but dangerous drug. It might be best to say quinidine given properly is not a really dangerous drug when given by those who understand the indications, toxic manifestations, and dosage.

Chapter two is devoted to the treatment of congestive heart failure. The recommendations for bed rest, the use of digitalis, sedatives, diuretics, diet, and treatment of special features such as severe dyspnea, Cheyne-Stokes respiration, cardiac asthma, etc. would probably meet the approval of most cardiologists.

Chapter three is devoted to the treatment of diseases of the coronary arteries, including acute myocardial infarction with its complications, angina pectoris, etc. The recommendations made here

probably represent the procedures followed by those of experience.

The chapter on the treatment of disturbances in cardiac rate and rhythm mentions about all the drugs that are used in these conditions and calls attention to the fact that the treatment of extrasystoles is often unsatisfactory and they are generally harmless and reassurance is usually all that is needed. Extra systoles that are due to organic heart disease may be serious and might be relieved by treatment.

In the treatment of paroxysmal tachycardia, supraventricular, ventricular, auricular fibrillation and auricular flutter the drugs mentioned are those usually employed in these conditions. He considers digitalis a dangerous drug in ventricular tachycardia.

There are about two and a half pages devoted to the discussion of sino-auricular block and auriculoventricular block. The treatment recommended is along the usual lines and is sufficient for ready reference. The treatment of cardio-aortic syphilis is based largely on the teachings of J. E. Moore. There is a short discussion of congenital malformation of the heart and great vessels. Attention is called to the great help rendered by surgery, penicillin, and other antibiotics.

The author believes that the treatment of hypertension is still unsatisfactory and that nervous or emotional strain is an important factor. The patient should be assured and encouraged, avoiding frequent determinations of the blood pressure. Moderation in work and exercise and a calm state of mind are frequently sufficient for the average patient with asymptomatic hypertension.

In hypertension with cardiac symptoms he speaks of bed rest, sedatives and some of the nitrates. He questions the advisability of the use of thiocyanates. He considers diet an important element in the treatment of hypertension and speaks favorably of the Kempner plan and advises that more conservative measures should be tried before surgery is resorted to. There are many of wide experience who will agree with the statements made here.

The opinions expressed in the chapters on the heart in endocrine, metabolic disorders, and heart disease in pregnancy and surgery practically represent those generally held by cardiologists with an occasional statement that needs emphasis such as, "Congestive heart failure can be recognized by a careful history and a meticulous physical examination rather than by instrumental or laboratory aid" or one that may be called into question such as the statement on page one hundred sixty-eight, that intraventricular or bundle branch block is generally due to widespread myocardial disease and should be regarded as a serious surgical risk.

This is a little difficult to accept when one observes patients with either right or left bundle branch block that live a normal life for twenty and twenty-five years without heart failure.

This book should prove very helpful as a quick reference in the treatment of various types of heart disease and is recommended.

J. M. BAMBER, M. D.

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PUBLICATIONS RECEIVED

Froben Press, Inc., New York: *Lives of Master Surgeons*, by R. A. Leonardo, M. D., Ch. M., F. I. C. S.

Paul B. Hoeber, Inc., New York: *The Clinical Management of Varicose Veins*, by David Woolfolk Barrow, M. D. *An Introduction to Gastro-Enterology* (Fourth Edition, Revised and Enlarged), by Walter C. Alvarez, M. D.

Lea & Febiger, Philadelphia: *Diabetic Manual for the Doctor and Patient* (Eighth Edition), by Elliott P. Joslin, M. D., Sc. D.

The C. V. Mosby Company, St. Louis: *Human Biochemistry* (Second Edition), by Israel S. Kleiner, Ph. D. *Pathology*, edited by W. A. D. Anderson, M. A., M. D., F. A. C. P.

Statesman Press, Washington, D. C.: *The Case Against Socialized Medicine*, by Lawrence Sullivan.

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THE PATHOLOGY OF TRANSFUSION REACTIONS*

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NEW ORLEANS

INTRODUCTION

The text of this presentation will deal only with the hemolytic transfusion reaction caused by accidental administration of incorrect blood types and Rh factors. The hemolytic type of reaction is frequently fatal. An understanding of the pathologic anatomy and the disturbed physiology of this condition is essential to proper treatment. Although much light has been shed on this subject within recent years, there still remain many unanswered questions. Anyone who has had the unfortunate experience of encountering a fatal transfusion reaction realizes more than ever how perplexing this problem can become.

It is a well recognized fact that the pathology of hemolytic transfusion reaction is very similar to, and objectively the same as in many other conditions. The crush syndrome, shock, mushroom poisoning, burns, heat stroke, sulfonamide intoxication, and toxemias of pregnancy may produce the same pathologic findings. The pathologic anatomy primarily involves the kidney in these conditions and, of course, there is other pathology secondary to renal failure.

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The renal pathology has most often been described in the literature under the heading of "Lower Nephron Nephrosis" or "Hemoglobinuric Nephrosis". An exhaustive study of this subject has been recently reported by Lucke¹.

GROSS PATHOLOGY

The kidneys are usually swollen and edematous in appearance; their weight is from slightly to much increased. There is a tendency for greater swelling when the survival period is longer.¹ The capsule strips with ease from a previously normal kidney showing a smooth pale outer surface. When the organ is sectioned, the pale cortex bulges, is wider than normal and is sharply demarcated from the brownish purple well striated medullary portion. Occasionally small hemorrhages may be noted in the calices and pelvis.

MICROSCOPIC PATHOLOGY

There is some divergence of opinion regarding the histopathology. According to Lucké¹, Mallory² and others, the main objective histopathologic features are found in the lower segment of the nephron where degeneration or actual necrosis involves selectively focal portions of the thick tubules of Henle and the distal convoluted tubules. The more severely disintegrated portions of the tubules are apt to provoke edema and cellular reaction in the surrounding stroma, and thrombosis of adjacent veins may occur. Brownish or eosinophilic granular casts are found in the distal segments and collecting tubules. Although focal degeneration of epithelium has been noted in the collecting tubules, such changes are less fre-

quent and nearly always adjacent to heme casts. Frequently the proximal convoluted tubules appear dilated and their lining cells swollen. Of this latter point, there can be little doubt, but Mallory² points out, frozen sections on formalin fixed tissue suggest that the appearance of dilatation is largely, but not entirely artefact due to shrinkage. Moon³ states that in general all portions of the convoluted tubules are affected and believes the more pronounced changes to be in the upper segment. This view is at variance with that of most other observers, although minimal objective changes, i. e., slight "cloudy swelling" and occasional fatty deposits have been noted. According to Lucké actual necrosis in the proximal segment is very rare. The glomeruli are usually normal in size and cellularity but with poor blood content, suggesting inadequate circulation. Moon,³ however, is impressed with the hyperemia of the glomerular tufts. Recent work by Trueta⁴ *et al* and others would seem to support glomerular ischemia, except in the juxtamedullary glomeruli. There is frequently an eosin-staining, granular or globular precipitate in the subcapsular spaces, indicating an increased glomerular permeability. At times, there is some swelling of the normally flat epithelium of the capsule, especially near the mouth.

Time permits only a summary of the detailed pathology as follows: The damage to the tubular cells may vary from very slight to complete necrosis, at times even with rupture of tubular walls and extrusion of casts into the interstices. When this occurs, varying amounts of reactionary elements collect about the cast forming a "granuloma" which in time undergoes hyalin change. The extruded cast is usually hyalin in nature rather than one of the more numerous heme casts. Regeneration of tubular epithelium starts after three or four days' survival and is almost complete if the patient survives for ten days or more. Ayer and Gould⁵ have described autopsy findings in 7 patients who died three hours to ten days after hemolytic reactions.

PATHOGENESIS AND DISTURBED PHYSIOLOGY

It seems fairly well accepted that no one single factor can account for the severe renal anatomic and functional pathology in this condition. That precipitated hemoglobin causes sufficient mechanical blockage to cause severe anuria is doubtful. Many tubules are not involved with casts. Yuile *et al*⁶ and others have been unable to produce renal insufficiency in dogs with single massive intravenous doses of hemoglobin regardless of the reaction of urine. While it is true that epithelial degeneration is sometimes noted adjacent to acid hematin casts, it has not been conclusively proved that this substance alone is definitely toxic. March hemoglobinuria and paroxysmal hemoglobinuria do not ordinarily produce renal insufficiency. Human experiments support the hypothesis that hemoglobin is excreted in large quantities only when the permeability of the glomerular filters is increased and that albuminuria coincidentally appears in all cases.⁷ This increased permeability could be explained on oxygen deficiency due to ischemia.

Mallory² suggests the possibility that anaphylaxis contributes to the reaction to incompatible blood. Certainly in severe reactions a state of shock is not unusual.

The hypothesis that disturbed renal blood flow plays a major role in this condition is receiving much attention and recently much factual data have been published in regard to cortical ischemia and renal medullary shunt mechanism. Trueta⁴ *et al* have made important studies concerning renal pathology caused by neurovascular disturbances. They have shown very convincingly that with appropriate nerve stimulation, both in animals with the abdomen unopened and in those in which the kidneys have been exposed, the renal blood flow may be diverted from its commonly accepted course, and that as a result the cortex may be partly or wholly deprived of its blood supply. These studies were carried out with the use of radio-opaque and dye substances. They found that the renal circulation time was shortened by one-half, though the calibre of the renal artery at the same time was re-

duced by one-quarter. This is strong evidence that a vascular short-circuiting mechanism exists. That the blood is being diverted from the cortex and short-circuited through medullary (especially subcortical) blood channels is proved by radiographic and other evidence. Further experimental work by the same group¹¹ shows that the blood is shunted through the juxtamedullary glomeruli to the vasa recta components and back to the interlobular veins. The outer cortex therefore remains relatively ischemic to varying degrees, while the inner cortex and medulla are hyperemic. They therefore show that in the experimental animal a renal circulation can be continued through the medulla while most of the cortex is functionally ischemic. They note also that under these conditions the flow of urine in the ureter decreases or is entirely suppressed. They suggest, with much reason, that nerve stimulation can be produced centrally or peripherally by a variety of noxious agents and that the picture seen in many loosely related syndromes—e.g., “sulfa kidney”, incompatible-transfusion kidney, etc., is a result of a defense device by which the cortex of the kidney is excluded from the circulating toxin or other noxious agent and thus protected. Too prolonged operation of the device results in permanent damage. Only recently I have had the opportunity to study necropsy material on the kidneys of a fourteen year old girl with bilateral coalescent cortical infarctions following furunculosis of the lower extremities. It is interesting speculation and quite possible that protective mechanisms against bacterial toxins may have caused this picture. No other obvious cause could be found in this instance. The picture is similar to the cortical necrosis that has been associated with postabortum state. The gross and microscopic picture presented is identical to the experimental lesions produced by Trueta⁴ *et al.*

Corcoran and Page⁸ point out that the principal lesion resulting from complete obliteration of renal arterial inflow is degeneration of the proximal convoluted tubules and suggest that this picture is dif-

ferent from that of lower nephron nephrosis. It would seem logical to assume that complete renal ischemia should produce a different picture from that of incomplete ischemia or medullary “short circuit” as described by Trueta⁴ *et al* for the following reasons: In the first instance, the blood supply is completely cut off from the glomerular apparatus as well as all tubules. Complete anuria must exist. In the latter instance, cortical ischemia is a relative thing and may be of varying degrees of intensity. It must be assumed that unless complete anuria exists that some blood must pass through the afferent arterioles into the glomerulus. This amount may be and undoubtedly is often very small and of low hydrostatic pressure. It may be sufficient however to prevent complete anoxia of the glomeruli and to prevent marked objective histopathologic changes but not yet enough to prevent altered physiology, i.e., increased capillary permeability. Since practically all of the arterial blood of the kidney passes through the glomeruli before being distributed to the rest of the organ (Maximow and Bloom⁹) it can be assumed that the glomeruli would have first call on whatever small amount of blood-borne oxygen that may later reach the renal tubules. Both the proximal and the distal convoluted tubules then have reason to show more objective pathology than the glomeruli. As has been pointed out, there is difference of opinion as to which set of convoluted tubules show the most change. These differences may possibly be explained on a basis of priority of blood supply from the efferent arteriole of the glomerulus. Since the minute circulation of the cortex is still the subject of investigation, this point is open to question.

MECHANISM OF OLIGURIA

From reviewing the physiologic and pathologic mechanisms discussed it appears that several factors must be considered in the mechanism of oliguria.

The hypothesis that the tubules are so completely obstructed by heme pigment

as to cause oliguria is open to serious question, for in many instances insufficient tubules appear obstructed. If mechanical obstruction were the sole cause, one would expect a severe grade of internal hydronephrosis with dilatation of tubules above the point of obstruction and dilatation of the space between Bowman's capsule and the glomerular tufts. Such is not the case.

In the light of present knowledge, it seems quite likely that altered renal blood flow plays the fundamental role in production of the pathologic, anatomic, and physiologic findings. It is well accepted that renal blood flow may be tremendously decreased in shock states, sometimes as much as one-twentieth of normal values.¹⁰ Experimental procedures mentioned previously have proved that in certain conditions, the cortical blood supply may be almost entirely shunted to the medulla.⁴ Changes due to anoxia necessarily follow, producing altered physiology and degenerative changes in the glomeruli and tubules as described. Further degenerative disease may possibly be caused by the presence of heme products. It may well be then that the oliguria is brought about as follows: (1) Degenerative and physiologic changes are caused by altered blood flow and cortical ischemia. (2) Decreased hydrostatic pressure in the glomeruli produces less filtrate. (3) Such filtrate as passes the glomeruli may be taken back into the circulation by unselective resorption of the damaged tubules. (4) The possible factors of mechanical obstruction due to heme casts, interstitial reaction, and edema must be taken into consideration.

SUMMARY

1. The altered physiology and pathologic findings in hemolytic transfusion reactions are similar to those of many other conditions producing the picture of "lower nephron nephrosis".

2. Recent experimental data strongly suggest that the pathology and physiologic changes are not confined to the lower nephron, but include the entire nephron, and are comparable with the changes found

in ischemic cortical necrosis previously described associated with postabortive cases.

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CAUSES AND PREVENTION OF TRANSFUSION REACTIONS*

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NEW ORLEANS

Attempts to classify transfusion reactions seem inevitably to run afoul of the old chicken-and-egg or "which came first" fable. Some causes are well understood, while their effects, as exhibited by the patient, are in many cases but imperfectly known. Conversely, rather well defined reactions are encountered in which the true nature of the etiologic agents remains obscure. The causes of some reactions are entirely exogenous. Others may be endogenous, while in many both exogenous and endogenous factors are concerned.

NON-HEMOLYTIC REACTIONS

Pyrogenic Reactions: Pyrogen may be loosely defined as any substance which when injected intravenously will cause an elevation of temperature. This would in-

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clude all sorts of debris remaining in improperly prepared blood-collecting or administering equipment: old blood clots, dried proteins, bacteria, lint, etc. More strictly, pyrogens are water soluble, toxic products of bacterial metabolism and are extremely thermostable and capable of passing through very fine bacterial filters.

Pyrogenic reactions usually manifest themselves within ten to thirty minutes following the start of the transfusion:

A. Mild form:

1. Chilly sensations or mild rigor.
2. Relatively little temperature increase (103° F. maximum).
3. Slight frontal headache at times.
4. Some apprehension.
5. Temperature subsides in an hour or so.

B. More severe form:

1. Moderate to marked rigors.
2. Temperature may reach 105° F.
3. Flushing of facies.
4. Post-sternal oppression, with or without dyspnea and cyanosis.
5. Frontal headache.
6. Muscular pains.
7. Nauseated in some instances.
8. Apprehension usually acute.
9. Fever may persist for four to six hours.

Not all of the above signs or symptoms are necessarily exhibited by any one patient. I have never personally encountered a fatal pyrogenic reaction.

Prevention of pyrogenic reactions hinges on keeping pyrogen out of all apparatus used for collecting, transferring or administering blood. This simply means thorough and scrupulous cleansing and sterilization of all apparatus. I would stress these basic principles:

1. Flushing of all apparatus with tap water *immediately after use*.
2. Keeping all apparatus immersed in water until ready to re-prepare.
3. High pressure tap water flushing of rubber tubing for minimum of two hours, each length of tubing to be vigorously

stretched throughout its length several times during this phase.

4. Thorough soaking of all glass, metal and non-tubular rubber parts in a detergent for twenty-four hours.

5. Complete rinsing to remove all detergent or soap used in step 4.

6. Flushing of all parts of each set with copious quantities of *fresh, pyrogen-free* distilled water immediately before assembly.

7. Sterilization of apparatus *within one hour of assembly*.

8. Operation of autoclave by time and temperature method only.

9. The assignment of competent non-rotating personnel to all the above duties.

Time does not permit a detailed discussion of the principles of *water-still* construction and operation. The type of still required will be largely determined by the size of the hospital and the nature of the raw water supply. I would personally recommend the Barnstead Type "Q" still as minimum standard. In some localities double or triple stills should be used.

Pyrogen-free distilled water is obtainable commercially in hermetically sealed flasks, but is too expensive except for emergency or small scale operations. Such water will *not* remain pyrogen free indefinitely once the hermetic seal is broken.

Until recent years it was customary to use stainless-steel mesh filters in administering citrated blood. These require cleansing in C. P. nitric acid and we discontinued them about eighteen months ago in favor of disposable plastic filter elements.

Many small and some large hospitals now use the efficient, disposable collecting and transfusing sets provided by the two major commercial solution laboratories for use with their standard vacuum transfusion bottles.

A container of blood should not be opened until one is actually ready to administer it to the patient. If, for any reason, the blood is opened but not used, the top should be promptly covered with several layers of sterile gauze and the bottle returned at once to the laboratory refrigerator. We feel that

blood so opened should not be used after six hours.

Thermal Reactions: This is a classification developed in an effort to remove some of the obscure non-hemolytic, *pyrogen-like* reactions in which the following circumstances seem to be involved:

1. The condition of the patient. In a toxic individual exhibiting a spiking temperature curve, the administration of blood sometimes gives rise to chill and febrile reactions. In view of the complex nature of whole blood and the altered blood chemistry of such patients, we believe that many apparently mild pyrogenic reactions experienced by them actually are coincidental and therefore not true untoward transfusion reactions.

2. The temperature of the blood. Since, with rare exceptions, we use only refrigerated bank blood on our transfusion service, we have at times felt that mild chills, especially in toxic or debilitated patients, may be actually due to the administration of cold blood, especially where 500 c.c. have been administered in sixty to seventy-five minutes.

The heating of blood should be forbidden, unless it is done in a properly controlled incubator under competent supervision. (Maximum temperature not to exceed 99° F.) Excessive heating of blood or plasma can alter the proteins sufficiently to produce severe reactions. For the great majority of patients I see no need for any warming of the blood.

Allergic Reactions: In our experience this has been the most common type of non-hemolytic reaction. At present it is believed that allergic antigens and/or antibodies in the donor's blood are responsible.

Mildest and most frequent allergic reaction is simple urticaria, appearing after administration of from 50 to 500 c.c. of blood. At times slight angioneurotic edema appears. Eosinophilia is not uncommon, as is mild fever. Itching may precede appearance of wheals.

More severe allergic reactions are denoted by asthma, with or without the above

signs. Infrequently the asthmatic seizure is severe and acute laryngeal edema and bronchospasm develop, while involuntary passage of the excreta may occur.

The most severe form of allergic reaction may begin with urticaria and angioneurotic edema followed rapidly by the development of anaphylactoid shock with marked hypotension. Very rarely death will ensue.

At present, prevention of allergic reactions rests chiefly on careful selection and control of donors:

1. Donors are requested to refrain from all foods and beverages for a minimum of four hours before phlebotomy, with the following exceptions: dry toast and jelly, plain coffee or tea with sugar, fruits, fruit juices.

2. No person is accepted as a donor who gives a history of urticaria, asthma or other allergy within one year.

The patient, especially if presenting a history of allergy, may be given 50 mgm. of Benadryl orally about two hours before starting the transfusion, at which time the dose may be repeated. Or a single 50 mgm. dose may be given intravenously just prior to beginning the transfusion. Proper cleansing of apparatus contributes to prevention of allergic reactions.

Psychogenic Reactions: Undoubtedly the patient's state of mind at times is sufficient to produce mild chilly sensations and even low grade fever. Such a situation can be confused with a pyrogenic reaction. Further, psychogenic and neurogenic factors undoubtedly are concerned in allergic reactions.

Reactions Due to Physical Factors: Cardiac and/or vascular mishaps, while extremely rare, as results of transfusion, can occur in the following circumstances:

1. Overloading of the circulation by too rapid administration of blood, especially in large volume. This is a real danger when the heart is partially decompensated. Transfusion is, of course, contraindicated in severe pulmonary edema.

2. Embolism will occur if small clots are permitted to enter the patient's circulation.

This is unlikely to happen if a properly assembled *filter* dripmeter is used. Forced administration of blood by applying positive pressure to the bottle is potentially dangerous in that it may cause a break in the filter. Further, it *may* allow administration of air sufficient to cause serious or fatal embolism.

HEMOLYTIC TRANSFUSION REACTIONS

All hemolytic reactions due to transfusion of whole blood or red cells have a common serologic basis: incompatibility between bloods of donor and recipient. Typically, the donor's erythrocytes possess antigens (agglutinogens) absent from the red cells of the recipient, while the latter's serum contains one or more antibodies specific for the donor's agglutinogens.

Some antibodies exist naturally and are known as normal antibodies. Best known examples are the anti-A and anti-B isohemagglutinins. These are specific for the A and B factors, which determine the four major blood groups: A, B, AB, O, of Landsteiner.

In addition to the normal isoantibodies there are the *irregular* or *isoimmune* antibodies. These result from immunization of the individual by antigens which have entered the blood stream by transfusion and/or pregnancy, the recipient lacking such antigens in his or her erythrocytes, thereby filling one requirement for isoimmunization.

Most frequently encountered irregular antibodies are those caused by immunization to one or more of the components of the Rh complex. Only rarely have persons been found who exhibited antibodies specific for the P, M or N factors. Rh isoimmunization, however, is known to be responsible for over 90 per cent of intra-group hemolytic transfusion reactions. Thus in preparing blood for transfusion, one must be constantly aware of the necessity of achieving both group and Rh compatibility. The latter is especially important in female patients for these reasons:

1. Patient may be Rh negative and actually possess Rh antibodies derived from pregnancy.

2. Transfusion of Rh positive blood into any Rh negative female may initiate an immunization which might result in an erythroblastotic baby years hence.

Rh negative male patients known or believed to be Rh immunized, should, of course, receive only compatible Rh negative blood in order to prevent the possibility of a hemolytic transfusion reaction.

The onset of a hemolytic reaction is presumably characterized by agglutination, but hemolysis of the donor cells quickly moves into the picture, as evidenced by the appearance of hemoglobinemia and hemoglobinuria within a few hours following transfusion of 50 c.c. or more of incompatible blood. The severity of hemolytic reactions is affected by a number of variables such as:

1. Quantity of blood transfused.
2. Strength and specificity of recipient's antibodies.
3. Rate of transfusion and rate of intravascular hemolysis.
4. General physical status of the recipient.

Perhaps the most prominent symptom of a hemolytic transfusion reaction is pain in the lumbar region. This tends to occur immediately and is usually accompanied or followed by dyspnea, cyanosis, and a sense of thoracic constriction. Nausea, vomiting, and abdominal pain are not uncommon occurrences and chills and fever may usher in the reaction. The patient is usually quite apprehensive. Hypotension is common with pulse rapid and weak. These signs and symptoms, in various combinations, may be said to represent the acute phase of the reaction. (Instantaneous death due to cardiac or cerebral embolism by masses of agglutinated donor cells is a possibility but is so rare as to be almost unknown.)

Usually the acute phase subsides in several hours and the patient rests fairly easy. Jaundice will usually appear in eighteen to thirty-six hours. Some patients show little

if any decrease in the renal function while others exhibit urinary suppression for twenty-four hours to fourteen days. The uremic state intervenes and may terminate in death, although some patients will gradually regain their kidney function and survive. Although hemolytic reactions are rare, the death rate has ranged from 50 to 90 per cent for many years.

In the event a hemolytic reaction is suspected, one should immediately obtain blood and urine samples to inspect for free hemoglobin. Blood groups and Rh types of patient and donor should be rechecked, as well as the cross-matching.

The present discussion does not consider the treatment of reactions, but, for most of them, prevention is by far the best therapy. This is fearfully true of the hemolytic variety. Observance of a few essential safety rules will do much to avert such tragic episodes:

1. Accurate and complete labeling of all blood samples and bottles of blood.
2. The use of potent, *human* grouping and Rh typing sera.
3. Careful cross-matching of patient's and donor's bloods.
4. Close observation of the patient during administration of the first 50-100 c.c. of blood, with immediate cessation if symptoms or signs of hemolytic reaction arise. Patients under general anesthetic must be constantly observed. Potential danger here is great.

Be sure before transfusing. Recheck all procedures employed in grouping, Rh typing, cross-matching and identifying of all bloods concerned. It has been said that a bottle of blood is like a stick of dynamite. Both are capable of causing great destruction if misused.

ANTICOAGULANTS IN THE TREATMENT OF POSTPARTUM VENOUS THROMBOSIS AND EMBOLISM*

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AND

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The past decade has seen the physician's armamentarium for the treatment of thrombo-embolic phenomena enhanced by the addition and clinical application of two potent anticoagulant substances; namely, heparin and dicumarol. While a considerable literature has developed relating to the clinical experiences with these preparations in the treatment of medical and postoperative conditions, we were able to discover but one report, that of Davis and Porter,¹ relating to their use in any series of patients in the postpartum state. Therefore, without entering into a discussion as to the relative merits of this treatment and treatment by means of sympathetic block and ligation of the superficial femoral veins, since we have had practically no experience with the latter method of treatment, we are reporting our experiences with the use of heparin and dicumarol in obstetric patients.

GENERAL CONSIDERATIONS

Heparin.—Heparin was discovered some thirty years ago by Howell.² It is thought to be produced in the body by the mast cells of Ehrlich. It is a mucoitin polysulfuric acid and its activity is presumed to be owing to its strong negative electric charge. The effect of heparin on the blood is instantly neutralized by the addition of basic protamine. Soon after heparin was obtained in pure state in 1935, it was utilized in the treatment of thrombosis, and Murray and Best³ and Murray⁴ in Toronto

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reported the successful use of the drug in thrombophlebitis and embolism. The characteristic almost instantaneous action of this substance makes it desirable when a rapid response is indicated. The use of heparin does not require the meticulous laboratory control which is necessary for the safe use of the other anticoagulant, since, should bleeding occur, the drug can be withheld and ordinarily the blood can be expected to return to its normal state of coagulability within a period of a half to two and a half hours. However, the dosage ordinarily is determined on the basis of the coagulation time of the blood. An effort is made to maintain the clotting time between twenty and twenty-five minutes.

The disadvantages of the use of heparin are that it must be administered parenterally and that it is relatively expensive, both facts mitigating against prolonged use of the drug in any given case.

Dicumarol.—Roderick⁵ first recognized that hemorrhagic sweet clover disease of cattle was due to a product which resulted from the spoilage of clover hay and which impaired the coagulation of blood. The fascinating story by Link,⁶ of the University of Wisconsin, given in the Harvey Lectures in 1943 and 1944, details the isolation, identification, and later the synthesis of this compound by him and his co-workers and describes, indeed, a masterpiece of scientific endeavor.

Dicumarol, which chemically is 3,3'-methylenebis (4-hydroxycoumarin), is a crystalline substance with a melting point of 288° to 289° F., which, when administered orally to animals and human beings, so impairs the ability of the liver to produce prothrombin that the resultant prothrombin deficiency vitiates the coagulation of blood. In toxic doses this substance produces central necrosis of the hepatic lobule, and death from generalized hemorrhage occurs. As a secondary effect of prothrombin deficiency the coagulation time of the blood may be prolonged, but this effect does not necessarily parallel the degree of prothrombin deficiency and hence the coagulation time cannot be used safely

as the basis for controlling administration of dicumarol.

The effect of dicumarol is relatively slow in appearing. An interval of twenty-four to forty-eight hours elapses from the time the substance is administered until its full effect is meted in terms of prothrombin deficiency, but the effect is maintained several days after the drug has been withdrawn. That the effects on the liver, when dicumarol is administered in therapeutic doses, are not permanent is displayed by the fact that liver function tests give normal results even after this prophylactic agent has been administered for several months.

As in animals, so in human beings there has been shown to be considerable individual variance in tolerance to the drug, and Link⁶ showed that in animals this variation in tolerance was an inherited trait, passing according to the Mendelian law. The above-mentioned characteristics make it imperative that dicumarol should never be given to a patient unless the dosage can be gauged on the basis of the daily determination of blood prothrombin time, lest hazardous results supervene.

Dosage.—For the purpose of clarifying the data on dosage which are to follow, a word of explanation regarding the determination of the prothrombin time is given.

At the laboratory in the Mayo Clinic a Magath modification of the Quick method is used, giving a normal prothrombin time of 17 to 19 seconds, which may be considered 100 per cent. A prothrombin time of 27 seconds signifies that the value for prothrombin is 30 per cent of normal, one of 35 seconds signifies a value of 20 per cent of normal and one of 58 seconds signifies a value of 10 per cent of normal.

It is to be pointed out that these values will vary for different laboratories in which different technics and different thromboplastins are used. The physician who is to supervise dicumarol therapy will find it necessary, therefore, to familiarize himself with the relationship of prothrombin time to prothrombin percentage as determined in his particular laboratory. Allen and Barker and their associates⁷ at the

clinic, in a clinical study of more than 2,300 medical and surgical patients who received dicumarol, have shown that serious bleeding will almost never occur if the value for prothrombin is greater than 10 per cent of normal, and that, on the other hand, thrombosis will usually not occur if the value for prothrombin is less than 30 per cent of normal. Therein, then, lies the essence of the therapeutic exhibition of dicumarol. The drug must be administered in doses sufficient to hold the patient's prothrombin value within the limits of the individual tolerance, somewhere between 10 and 30 per cent of normal.

After considerable study we have finally adopted the following plan of administering dicumarol. When the drug is definitely indicated and when used prophylactically, 300 mg. are given on the third postpartum day as the first dose. Each subsequent day the prothrombin time of the blood is checked and if the value for prothrombin is found to be less than 20 per cent of normal, no further dicumarol is given, but on the days this value is found to be greater than 20 per cent of normal, an additional 100 mg. are given. If the patient is found to be resistant to the drug, as indicated by only minimal change in the prothrombin time, the subsequent doses may need to be increased to 200 mg. while, conversely, if an unusual sensitivity is demonstrated by the precipitous development of prothrombin deficiency with a prothrombin value that is below 10 per cent of normal, the doses may be further spaced or reduced. Barnes and Ervin⁸ reported a study in which they gave 300 mg. of dicumarol while the patient was in labor and 200 mg. on the first postpartum day; they noted no appreciable increase in lochia.

Link⁶ showed that the response to dicumarol was slowed and reversed by the simultaneous administration of vitamin K (2-methyl-1,4-naphthoquinone. Experience with medical and surgical patients has indicated the prudence of giving 60 to 72 mg. of vitamin K intravenously if the percentage of prothrombin is less than 10 per cent of normal. Previous reports, which

concern all types of surgical conditions, show that about 3 per cent of patients receiving the drug experience minor episodes of bleeding, such as petechial hemorrhages of the skin, epistaxis, microhematuria or oozing from raw surfaces, and that about 1 per cent of patients experience severe hemorrhages. It is reasonable to assume that this same percentage of hemorrhagic complications will occur in the postpartum patient if a large enough series is observed, and this risk must be accepted in contemplating the use of the drug.

The contraindications to the use of dicumarol are hepatic diseases with associated prothrombin deficiency, renal insufficiency, states of severe nutritional deficiency, blood dyscrasias with tendency to bleed and subacute bacterial endocarditis. The drug is used only with great caution in patients with ulcerative diseases. Though none of the above-mentioned complications occur frequently in the pregnant or postpartum state, it is well to keep the possibility of their appearance in mind.

CLINICAL EXPERIENCE

Our first experiences with the use of anticoagulants in postpartum patients began in August, 1940, when, within a few days, 2 patients who had been delivered elsewhere were admitted to our service; both had severe pelvic thrombophlebitis. In both of these patients, in spite of the usual conservative treatment, thrombosis developed elsewhere in the body; finally, each had clinical and laboratory evidence of pulmonary infarction and their condition became desperate. It was decided to risk heparinization of these patients, with the realization that should uterine bleeding occur, the situation could probably be controlled with transfusions and withdrawal of the drug. Both patients made an immediate and dramatic recovery. With this experience in mind, heparin and, later, dicumarol when it became available, were then given to additional patients with what we considered satisfactory results.

For the purpose of this study we have reviewed the records of 56 patients with

severe postpartum thrombo-embolic phenomena who have been encountered on the obstetric service at the clinic during the 10-year period, 1937 through 1946. The study by no means included all the cases in which thrombo-embolic phenomena occurred on the service, but in each of these 56 cases the condition was severe enough to assume major importance for the patient. Of this group of 56 patients, 6 received heparin alone, 28 received dicumarol alone, and 2 received both heparin and dicumarol. Thus, a total of 36 patients had anticoagulants of one type or the other or both. Since the remaining 20 patients were treated by means of such conservative measures as warm, wet dressings, elevation of the affected extremity and sedation, it was felt that they might serve reasonably well as a control group.

Studying the records of this group of patients as a whole produced the usual information that is obtained in such cases. About one third of the patients came to delivery with severe anemia. Thirty-three, or 58.9 per cent of the group, had trouble with varicose veins in the prepartum period. Only 23, or 41.1 per cent of the deliveries were spontaneous, while 58.9 per cent were operative deliveries; 17 patients, or 30.4 per cent, were delivered by Cesarean section.

The earliest occurrence of thrombophlebitis was on the third day; the average time of occurrence was the fifth to seventh day. Pulmonary emboli tended to occur about the eighth to the tenth day. In those patients with thrombophlebitis the primary difficulty occurred in the left leg in 30 patients, in the right leg in 14, and in both legs in 6. Nine patients of the entire group had pulmonary emboli. In each instance the diagnosis of pulmonary infarction was confirmed by roentgenogram, and often electrocardiographic evidence was present. Six patients who gave a history of previous pulmonary embolism or severe thrombotic phenomena were given dicumarol prophylactically. We felt that such prophylactic treatment was justified since Barker and co-workers⁹ had shown in a statistical study

of 678 surgical patients who previously had had nonfatal postoperative pulmonary embolism and infarction that the incidence of subsequent venous thrombosis and embolism was 43.8 per cent, and of subsequent fatal pulmonary embolism, 18.3 per cent. We have reason to suspect that the same approximate percentage relationship may obtain in obstetric patients.

All patients who received anticoagulants made rapid and satisfactory recovery. No patient with thrombophlebitis who received the drugs experienced pulmonary embolism after institution of this type of therapy, though Jorpes¹⁰ reported the expected incidence of pulmonary embolism as a sequel to thrombophlebitis to vary between 15.8 and 35.8 per cent in obstetric cases. The period of hospitalization in the group of patients treated with anticoagulants was less than twenty days for three fourths of the group, averaging about seventeen days for the entire group, and the longest stay was forty-four days.

In the control group only about one half of the patients were out of the hospital in twenty days, the average stay being twenty-two days and the longest stay being sixty-five days. Seventeen of the 20 control patients showed residual venous insufficiency at the end of six months. However, only 5 of 32 patients who were treated with anticoagulants showed any degree of residual venous insufficiency at the end of six months and in only 1 patient was the insufficiency severe. There were no deaths in the entire series of 56 patients.

During the course of our study we encountered an article written by Field¹¹ in 1945 in which he stated that the rat pups of suckling mother rats which had been given toxic doses of dicumarol succumbed to internal hemorrhages, indicating that the drug was transmitted through breast milk. This gave us some momentary concern for the infants of mothers on therapy, but further investigation showed that surprisingly few mothers in the series had lactated sufficiently to be able to nurse their babies. Studies of prothrombin time

of the blood of the few babies that did nurse indicated that the value for prothrombin was consistently 100 per cent of normal, while the prothrombin time of the mother's blood indicated that the value for prothrombin was between 10 and 30 per cent of normal. We recognize that this may possibly be due to acquired protection, since all of our infants routinely receive injections of vitamin K at birth. However, it would appear that until more is known in this regard it would be safest to discontinue breast feeding for infants of mothers receiving dicumarol, or to give the infants 2.4 mg. of vitamin K intramuscularly every second day and to check the prothrombin time carefully.

In the entire series, 4 patients had minor phenomena of bleeding, usually noted as slight increase in lochia or petechiae of the skin. In no instance was it necessary to do other than to adjust the dose of the drug more carefully. One case which will be reported in detail elsewhere was that of a patient with serious hemorrhage which continued, in spite of two intravenous injections of 72 mg. of vitamin K, until the uterus was packed with iodoform gauze. During the period of bleeding the patient received 7,800 c.c. of blood by transfusion.

In the light of our experience with this patient we are now inclined to believe that should serious uterine bleeding occur during the administration of dicumarol, in addition to giving vitamin K intravenously and sufficient blood to replace the volume of blood lost, there should be no delay in packing the uterus firmly with gauze and in giving oxytocics. These measures, by stimulating firm muscular contractions, tend to close the uterine sinuses and control bleeding in much the same manner that uterine contractions control blood loss immediately after the expulsion of the placenta.

SUMMARY

We have reported on a series of 56 cases in which thrombo-embolic phenomena occurred in the postpartum period. Of this group 20 patients were treated by conservative measures alone and served as a control

group. The remainder had anticoagulants of one type or another.

The patients who were treated with anticoagulants made a more rapid, smoother recovery than did those in the control group and they showed almost no residual venous insufficiency when examined six months later. There were no deaths in the 9 cases of pulmonary embolism. The dangers and necessity for close supervision of patients receiving anticoagulants are pointed out.

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HISTOPLASMOSIS*

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For many years it has been known that throughout a large territory in the Mississippi Valley, pulmonary calcification is a very common occurrence. The generally accepted cause for such lesions has been the tubercle bacillus and the diagnosis "primary complex arrested" is widely used. However, tuberculin testing and x-ray

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studies, too numerous to mention, have produced these conclusions:

1. Calcifications are seen in large numbers of relatively young children who are non-reactors to tuberculin and who are life long residents of low tuberculosis mortality areas.

2. The tuberculin test is very reliable. Sensitivity to the dose .0001 P.P.D. usually persists for years.

These conclusions cannot be reconciled with the view that tuberculous infection is always the antecedent of pulmonary calcification. It is highly improbable that young children can lose tuberculin sensitivity in so short a time. The dose of P.P.D. mentioned above is five times the usual first strength P.P.D. and has been well established as a good critical level for clinical use.¹

C. E. Smith² of Leland Stanford, Jr. University, did a great deal of skin testing with coccidioidin at some of the California air fields because of some slight apparently cross reactions. He came to the conclusion that there was some fungus producing lung infection in the middle west, and he further called attention to the fact that the Mississippi Valley was the endemic area for *Histoplasma capsulatum*. Amos Christie,³ a former student of Smith's, went to Vanderbilt University in the fall of 1943. In January, 1944, he was able to diagnose histoplasmosis ante-mortem, a very rare procedure at that time. Soon after this he began doing skin tests using a solution of a broth filtrate culture.

Carroll Palmer⁴ had been studying minimal tuberculous lesions in nurses in widely separated geographical areas. Routine tuberculin testing and x-rays every six months for a period of over two years had shown wide differences in calcification and sensitivity to tuberculin. This was especially striking when the two cities, Minneapolis, Minnesota, and Kansas City, Missouri, were considered. In each about 1,000 nurses were studied. He found about ten times more pulmonary calcification in the Kansas City group, yet the tuberculosis incidence was about the same in the two

cities. Skin testing³ over 10,000 nurses with 1.1000 histoplasmin solution and tuberculin P.P.D. .0001, Palmer discovered that the two tests picked out practically all of those who had positive findings of pulmonary calcification.

The disease *Histoplasmosis*, has been known since 1905, but it was considered to be a very rare disease. Parsons and Zaro-fonetis⁵ in 1945 published an excellent review of the literature to date and reported 71 cases including their own. The disease at that time was considered to be always fatal. It occurred at all ages but more often in children. In the younger age groups it is characterized by unexplained fever, spleno- and hepatomegaly and leucopenia. It was usually misdiagnosed and called aleukemic leukemia, or some other blood dyscrasia. In the generalized acute forms lung findings are not prominent. In older age groups, lung findings seem more common, but no fixed pattern can yet be given. The lesions found cannot be distinguished from tuberculous by x-ray.

As a result of their studies both Palmer⁴ and Christie and Peterson³ concluded that there must be a very wide subclinical infection with histoplasma and that relatively few cases developed fatal forms. In doing this they were following the course of events that occurred in the study of coccidiomycosis and also for tuberculosis, both of which diseases were at one time considered always fatal. Palmer,⁶ continuing his nurse study, showed the geographic distribution of the persons listed. Over 10,000 nurses in eleven different cities were tested. He showed that the areas of greatest incidence ranged from eastern Kansas, eastward, including Ohio, and southward including Arkansas, Tennessee, and north-east Louisiana.

Since the original articles were published a great deal of work has been done, mainly by two groups, Christie and Peterson at Vanderbilt and by Palmer and his co-workers in the United States Public Health Service. In the summer of 1946 a field laboratory of U.S.P.H.S. began operation in Kansas City, Missouri, under the direction of

M. L. Furcolow. From this laboratory have come a number of important contributions. Many thousands of children and adults have been tested and x-rayed. From these studies much has been learned. At the start of this work we had these facts. There are a tremendous number of persons with calcified lesions who do not react to tuberculin and who do react to histoplasmin. There is a definite disease, histoplasmosis, which has been regarded as practically always fatal. It had been postulated that there was a sub-clinical or mild form of histoplasmosis which produced calcification. There were many missing links to be found.

One of the first questions to be settled was the specificity of the skin test. Among others, Emmons and Olsen⁷ question this. There certainly is no doubt but that there are some cross reactions between many of the fungi. Christie and Peterson are sure haplosporangium is not a factor.⁸ The greatest controversy seems to be concerning blastomycosis and histoplasmosis.

Howell⁹ studied these in animals and reported that "if the critical titre of these antigens are determined and if these concentrations are used to study cross reactions, the degree of cross reaction between these antigens is small and the antigens are, therefore, relatively specific for guinea pigs experimentally infected with the homologous fungi". In other words if correct doses are used there is little trouble. Furthermore in the studies in Kansas City the failure to find blastomycosis clinically leads us to believe it is not a factor in that area; also it is reported to us that blastomycosis does not produce calcific lesions.¹⁰ Work has not yet reached the point where we can say that the histoplasmin test is as reliable as the tuberculin test, but a part of the way has been traversed.

Another real point at issue was whether or not all proved histoplasmosis cases are fatal. Bunnell and Furcolow seem to have settled this question.¹¹ They reported 10 proved cases and since their report was written have added 2 more. Five of these have recovered definitely and two others are alive several months after diagnosis,

but the prognosis of these two is doubtful. The 5 give every indication of being perfectly well and of remaining so. This gap seems to be definitely bridged.

Another difficulty encountered was the problem of early diagnosis. Routine skin tests may be positive with or without pulmonary x-ray findings and the chest lesions when found vary considerably. Apparently the skin test behaves similarly to the tuberculin test in that during the first few weeks following infection it is not positive and in the presence of overwhelming disease there is no reaction.

Numerous men have been working on a complement fixation test. These reports have been published to date: Salvin¹², Miller *et al.*,¹³ Tenenberg and Howell,¹⁴ and Furcolow, Bunnell and Tenenberg¹⁵. The latter two reports deal with the work in Kansas City. It is too early to draw definite conclusions about the value of this test. However, all but one of the known proved cases have been positive. Some of the suspected cases have been positive and over 200 controls have been negative. The test seems to have great value in that it will be positive in those with active disease.

Other laboratory aids have been thoroughly studied, especially blood cultures, sternal punctures, biopsy methods, and others. In several cases the fungus was grown by culturing gastric washings. In patients with generalized disease, blood cultures have been quite successful. In the small or limited lesions and especially those in which some calcium has already been deposited no method of isolating or finding the organism has been successful.

Early in the investigation it was thought that if the pre-calcific lesions were of sufficient severity to necrotize lung tissue they should be visible on the x-ray film. Furthermore if the end result was indistinguishable from a tuberculous lesion, so might the *early* histoplasma infection. To study this over 16,000 Kansas City school children had tuberculin and histoplasmin tests and chest x-rays. All tuberculin reactors were excluded—all types of pulmonary lesions that appeared to be non-

calcified were grouped and restudied. Skin tests were repeated and chest films made at intervals of three or more months. In order to exclude acute infections, all lesions had to persist for two months or over. In addition all cases were given as complete a work-up as possible for tuberculosis, sarcoid, and other infections. From this large group 72 cases were finally selected. These were reported by Furcolow, *et al.*¹⁶ These range from cases with definite lymph node enlargements to those with single and multiple fairly discrete lesions with and without nodes, to massive and multiple infiltrations occupying both lung fields. Some of these cases have been followed over two years and a characteristic calcifying process observed.

Tuberculous lesions have been observed and their course described by many. Beginning with tuberculin non-reactors, the reaction has been seen to change, characteristic pulmonary lesions appear, and then gradually shrink and calcify. Various parts of this cycle have been seen to occur in patients sensitive to histoplasmin but who are tuberculin non-reactors. In the nurse studies, some non-reactors have changed to reactors and infiltrates in the lungs have been observed but not enough time has elapsed to see the final picture. In 2 of the cases in the group of 72, multiple diffuse lesions were present in both lung fields. From each of these cases histoplasma was isolated. Each has now progressed through the stages of clearing, resolution and calcification so that the end seems not far off. Both will have the final picture commonly described as "wheatena," with hundreds of small calcified areas in each lung. Most of the cases found will not have such extensive disease. There will be only one or two small areas of soft infiltration. In such cases it is doubtful if the disease ever extends further than the adjacent nodes and the organism does not circulate in the blood stream. Since these cases are not clinically ill and the disease seems to have no effect whatever it has been extremely difficult to obtain any pathologic material. Surface lymph nodes

seem to be rarely involved. Therefore, there are gaps in our knowledge which have to be filled.

However, if there are gaps yet existing, enough evidence is at hand to be of definite clinical assistance. First of all, we are now more sure of the reliability of the tuberculin test if employed in low dosage. We feel sure that these children with soft infiltrates and calcified or partially calcified areas, who are not tuberculin reactors, do not have tuberculosis. So far we have seen no reason for altering the daily routine of these patients. This is very important because in the past many of them were put to bed for long periods of time and many children and parents were unduly alarmed. In older age groups, for example, in the late teens soft infiltrates are seen which cannot be distinguished from tuberculous lesions by x-ray. It is the practice of some men to do collapse therapy on such minimal lesions. In the areas of histoplasmin sensitivity, these lesions must be carefully considered, and collapse therapy not done unless the tuberculin test is positive. In my opinion pneumothorax should not be done unless tubercle bacilli are found.

In adults, the picture is more confusing. Hollis Johnson¹⁷ of Nashville has reported a patient with a definite cavity. *Histoplasma capsulatum* was found repeatedly in the sputum. The lesion had all the appearance of a tuberculous lesion but tubercle bacilli were never found. A similar case is now under observation in Kansas City. Another case with chest lesions typical of tuberculosis came to autopsy. Diagnosis of histoplasmosis had been made by culture and tissue examination following splenectomy. Blood cultures and gastric cultures were positive. At autopsy, histoplasma was demonstrated in many organs and also tubercle bacilli were found in the lungs. In this case it was difficult to say which caused the lung lesion. The diagnosis of chest disease has in this area become a question of definitely finding the etiologic agent. There are undoubtedly many

cases of histoplasmosis masquerading as tuberculosis.

There is much more to be learned about the disease. It is significant that as late as January, 1945, a most thorough report collected about 70 cases of the disease. Furcolow and Bunnell in a little over two years time have 12 proved cases. Much has been accomplished to clarify pulmonary diagnosis and it is most likely that in the near future the remaining gaps in our knowledge will be filled.

CONCLUSION

A brief summary of the principal facts and theories of histoplasmosis as they exist at this time are given. The histoplasmin skin test if properly given, seems to be a reliable test. The complement fixation test has great promise. Known cases of histoplasmosis are alive and well. The necessity of careful differential diagnosis for tuberculosis is emphasized as some proved cases of histoplasmosis have all the appearance of tuberculosis. The possibility of co-existence of the two diseases must be born in mind and to date there is no information in regard to symbiotic phenomena. Northeast Louisiana is an area of high incidence for histoplasmin sensitivity.

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PEDIATRIC SURGERY*

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NEW ORLEANS

Compared with the tremendous volume of surgery done for adults, operations in infancy and childhood are not common. In general they are rare. Even from the children's hospitals, leaders in surgical advances in this field report tens and hundreds of operations of a specific type upon children whereas thyroidectomies, colon resections, hysterectomies, and other formidable procedures are reported even by individual surgeons in terms of thousands. The infrequency of surgery in infancy has resulted in a lack of experience in this field both in surgical technic and in surgical diagnosis. Most of the surgical problems of childhood will have to be handled by the general surgeon. How many general surgeons, extremely able and well informed otherwise, know immediately the answers to many of the questions pertaining specifically to the surgery of infancy; for example, the total parenteral twenty-four hour fluid and salt requirement for a baby with congenital atresia of the intestine or a pyloric stenosis? The answer to a similar question regarding adults is standard information known to every surgeon.

Technical and diagnostic advances have been made and the scope of surgery of in-

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fancy is rapidly being expanded. The type of surgery requirement encountered in infants differs sometimes from that of adults. Many other malformations may await correction at a later time but the serious obstructive malformations of the gastrointestinal tract require immediate operation. Alleviation or correction of obstructive lesions, such as hypertrophic pyloric stenosis, the operation for which is the most common operation performed in infancy, is imperative surgery. Imperforate anus and atresia of the esophagus likewise demand immediate surgical intervention. Tracheoesophageal fistulas are stated to be almost as common as hare lip, but this defect is frequently overlooked and it may cause death from pneumonia with the fundamental cause being unsuspected.

Since hypertrophic pyloric stenosis is the most common lesion requiring major surgery, I wish to recall a few important features in its management. Hypertrophic pyloric stenosis usually begins to manifest itself at from the third to the sixth week of life. It is characterized clinically by eructation and vomiting increasing in severity and by weight loss. Objectively an olive-sized mass is usually palpable in the epigastrium. Roentgenography shows gastric dilatation and retention and a funnel-shaped obstruction at the pyloric, with a string sign, an attenuated trickle of barium seen in lateral roentgenograms distal to the funnel-shaped obstruction.

A Fredet-Rammstedt operation is usually indicated when the diagnosis is established. The surgical risk is less than 1 per cent, whereas medical management alone is attended by a mortality of from 10 per cent to 30 per cent depending on the number of cases withheld from surgery.

These infants are dehydrated and depleted of proteins, and they are prone to develop a complication which is far too common following this operation; that is, evisceration. There is a great tendency to evisceration in infants. Even experienced surgeons may encounter it in 11½ per cent of cases. (Ladd and Gross). The inexperienced surgeon may feel that since it is

a child, wound healing will be rapid, and therefore, he will remove the stitches early. The result may be an evisceration. To prevent evisceration certain precautions are important: Fluid and proteins should be replaced as far as possible to the normal level; a transverse incision should be made, or if a right rectus incision is made it should be placed high so that during the period of healing the liver will protect the wound. I prefer retention sutures and do not like the sutures removed early (not under ten days). Another important technical feature of the operation is to sever the pyloric muscular ring and permit the mucosa to bulge without opening into the lumen. Such a misstep is more likely to occur at the duodenal end where the hypertrophic pyloric sphincter ends abruptly. The surgeon should be extremely cautious in that area.

Among the other types of operations required in infancy are those for atresia or stenosis of the duodenum or jejunum. Such an obstruction manifests itself promptly at the beginning of life. The predominant symptom is vomiting. The vomitus contains bile. Roentgenograms show air in the stomach and duodenum and no evidence of gas in the lower bowel. A roentgenogram after instilling lipiodol or perhaps barium will usually show a dilated stomach and duodenum. (Fig. 1) Congenital obstruction of the duodenum notably occurs in the distal portion. Stenosis simulating complete atresia frequently is due to compression of the duodenum by peritoneal bands. A true atresia may be difficult to differentiate clinically from a stenosis due to such a peritoneal fold or to obstruction from malrotation of the intestine. Peritoneal veils causing obstruction may be found either across the third or fourth portions of the duodenum or across the first portion of the jejunum and should be searched for very carefully when duodenal stenosis or atresia is established as the cause of the vomiting. If there is a peritoneal veil, it may be cut and released and thus the obstruction is obviated. On the other hand, if there is a true atresia of the duodenum a gastro-en-

terostomy is usually conceded by most authorities to be the operation of choice. The roentgenogram in *Figure 1* shows a dilated

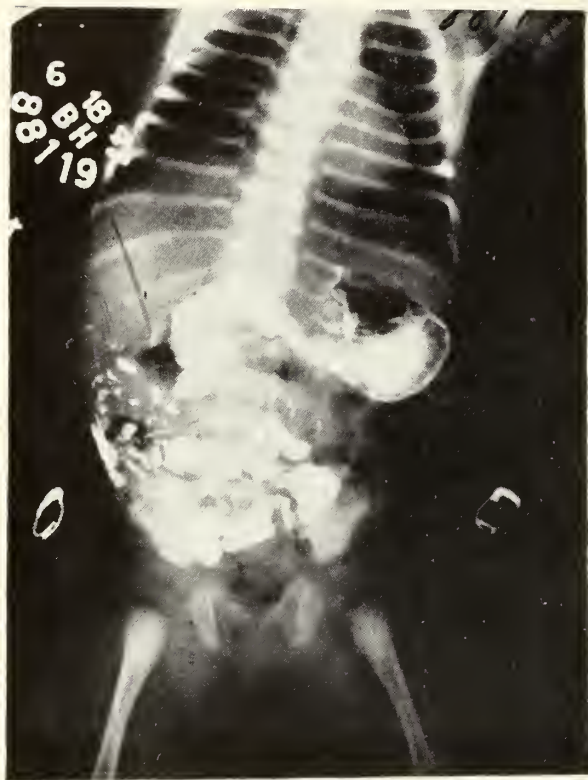


Fig. 1

Roentgenogram of a one month old baby showing obstruction at the end of the duodenum. The child presented signs of high partial intestinal obstruction. At operation a veil of peritoneum compressing the first part of the jejunum was found. This was severed and the child recovered promptly, showing no further symptoms of obstruction.

duodenum and stomach. Vomiting began early in life and conservative management resulted in weight loss and emaciation. At operation, performed when the child was one month old, peritoneal bands were found obstructing the jejunum at its initial segment. The obstructing bands were severed and the child promptly recovered.

Other obstructions of the gastrointestinal tract involve those near the anus or rectum. The Wangenstein-Rice method of determining the distance of the rectal pouch from the anal dimple should be well known and constantly used. When the rectal pouch is very high a colostomy is indicated.

Fortunately this type is not common. Various fistulas into the urinary tract or in the female between the rectum and the vagina are associated with atresia of the rectum (55 per cent of cases). These should be sought for carefully and recognized. Usually establishing a lumen through the normal area of the anal canal is a procedure of choice and the fistulas if present may secondarily close spontaneously or be closed by further operative procedure.

Atresia of the esophagus with tracheo-esophagus fistulas are by no means as rare as they were formerly thought to be. These are very complicated surgical problems. Many of these patients can be saved and returned to normal life by prompt operation. Many undoubtedly die of pneumonia without the true foundation of the cause of death being known. Establishing the diagnosis of the tracheo-esophageal fistula depends upon roentgenographic findings. In the gastrointestinal tract, there will be no air shown in those instances in which the lower segment of the esophagus does not communicate with the trachea. If there is a tracheo-esophageal fistula between the upper esophageal segment and the trachea (a rare type), lipiodol instilled into the esophagus will make its appearance in the lung field. In the more common type there is a communication between the lower segment of the esophagus and the trachea, and in roentgenograms of the abdomen air is found in the intestine. Lipiodol instilled into the esophagus shows a blind pouch and possibly some lipiodol aspirated into the trachea. Lipiodol does not make its appearance in the stomach. A number of these children have been saved by direct end-to-end anastomosis. Occasionally there is too much separation of the upper and lower segment of the esophagus. A palliative procedure disconnecting the fistula and a gastrostomy with a later operation to reconstruct an esophagus is a method which has been used for salvaging other children.

Various orthopedic malformations may present themselves early in life. Often these require corrective operations or corrective management over a long period of



Fig. 2

Marked displacement of the gastrointestinal tract to the left side of an abdomen in a 16 month old child. The tumor causing this was connected with the right kidney. Nephrectomy was performed and the child is still living and apparently well one year following operation. About 25 per cent of

children with embryomas of the kidney (Wilms' tumor) may be salvaged by surgery. Other lesions which may thus displace the gastrointestinal tract are omental and peritoneal cysts, enterogenous cysts, tumors of the liver and idiopathic dilatation of the common bile duct.

time. Usually an operation is not imperative. Urologic malformation such as ectrophy of the bladder are also distressing developmental defects which may wait beyond the initial period of infancy before the correction is attempted.

Many embryologic tumors are found in infancy among which should be mentioned the embryomas (Wilms' tumor) of the kidney, and various teratomas. These require prompt removal. A Wilms' tumor usually presents itself as a mass on one side of the abdomen. (Fig. 2.) Gastrointestinal tract roentgenogram shows that the gastrointestinal tract has been displaced remarkably to the other side. Pyelograms may show distortion indicating that the tumor involves the kidney. Usually Wilms' tu-

mors are highly malignant. On the other hand, about 25 per cent of the children might be saved by a nephrectomy. The proper nephrectomy involves a transabdominal approach with primary ligation of the vein and arteries to the kidney. The mass may then be removed without the same fear of disseminating the malignancy through the vascular system while the tumor is being manipulated. Other infantile lesions which displace the gastrointestinal tract are omental and mesenteric cysts and congenital dilatation of the common bile duct. Various other cysts and tumors involving the abdominal cavity, and masses caused by duplications of various segments of the gastrointestinal tract, may be encountered in infancy. Fortunately they are

rare, but they may require removal early in life.

Among the congenital defects in infants and children are hernias. Inguinal hernias, of course, are very common in the male. They may be repaired early but the optimum time is probably after the second year of life. Occasionally a strangulation or large hernia demands a repair during infancy. Usually there is nothing so difficult about repairing these congenital inguinal hernias but the tissues are extremely delicate. Omphalocele, large umbilical hernias, and congenital diaphragmatic hernias, if present, demand prompt recognition and emergency operation. A useful bit of knowledge in the operation for omphalocele is, that if the protrusion of abdominal viscera is marked and closure of muscle layers over the viscera can be accomplished only with undue tension, closure of the skin alone over the viscera may be a life saving measure. A two-stage repair of the abdominal wall is accomplished, the muscle layer being approximated after ten to fourteen days.

Diaphragmatic hernias, if present, may cause extreme dyspnea. Roentgenograms may disclose the cause for this. Usually the diaphragmatic hernia develops through the pleuroperitoneal canal, the foramen of Bochdalek. This is a posterior lateral aspect of the diaphragm where the anterior and posterior muscular layers normally fuse. As in the adults the preliminary phrenic nerve crushing, with immediate abdominal approach after decompressing the stomach and gastrointestinal tract usually permits a satisfactory closure. Ladd and Gross state that these hernias may be repaired much more easily in infants in whom the gastrointestinal tract had not had time to expand from interluminary air and ingested contents. If the lesion is diagnosed early in the infancy, it should be repaired immediately.

Various vascular abnormalities including patent ductus arteriosus and the tetralogy of Fallot have been yielding to recent marginal advance in the surgery of infancy and childhood. The outstanding work of Gross

and Blalock in this respect is becoming widely known not only to the profession but to the laity as well. These lesions usually do not demand emergency surgery, but they may require surgery during childhood after the period of infancy has passed. Congenital lymphedema should be operated upon early in childhood. We have had good results by excising the subcutaneous tissue and fascia containing the dilated lymphatics and fat.

Among the technical outstanding features in the surgery of infancy and childhood, what never ceases to be a subject of amazement to the surgeon, is the extremely fine delicacy of the tissues of children. Anyone who has performed experimental operations on dogs and rabbits has noted their transparently delicate membranes and organs and one is impressed by the similarity of the consistency of the tissues of the infant and of the rabbit. Both of them have very exquisitely fine organs. The small gastrointestinal tract and thin walls require very careful handling. Because of this, it is essential for a surgeon to be careful in making incisions in an infant. It is very easy to overcut particularly when customary force and speed has been used on the morning busy with adult surgery. In doing hernioplasties for example in small infants the external oblique aponeurosis appears so thin and frail that it would not seem capable of retaining the pressure imposed upon the abdominal wall. Carefully placed fine sutures are essential in this type of surgery. In making anastomoses or correcting pyloric stenosis, gross estimates of incisions and movements are not enough; they must be calculated almost with micrometer accuracy to be correct. For that reason it behooves the surgeon handling operations of infancy and childhood to be more cautious than he would be in his own experienced field of adult surgery.

A word about fluid requirement of infants. Almost all surgeons know how much fluids their adult patients require every day. This may be calculated even for difficult problems such as obstructions at the pylorus or upper gastrointestinal tract. The effort of replacing fluid and salt in the

quantity to be used is relatively well known in adults. On the other hand, the fluid balance and fluid requirements of infants is a more difficult subject. Usually an infant requires for a period of twenty-four hours from 70 to 90 cubic centimeters of fluid for each pound of weight. A maximum sodium chloride requirement is 4 or 5 grams. In an adult thus an intake of 2500 to 3000 cc. of fluid a day is comparable to an infant's intake of from 500 to 600 cubic centimeters a day. In addition to that, the infant will not be able to use sodium chloride to the same extent as an adult. A normal requirement for an adult would be less than 10 grams a day, but for an infant 4 or 5 grams is abundant and an intake of 10 grams of salt a day will eventually result in salt edema. Transfusions in infants may be given in the head or neck veins and a quantity of blood equivalent to 10 cc. for each

pound of body weight would be comparable to a 500 to 700 cubic centimeter transfusion in an adult. Sometimes in dehydrated states after repeated vomiting an intake in an infant of as much as 1000 cc. a day may be correct. Such a daily intake must not be continued otherwise the child will develop edema from plethora. Children should be prepared for operation carefully just as in adult life. Such preparation necessitates regard for the same factors of fluid and electrolyte replacement, protein and blood replenishment.

Only by careful attention to all the details will good results be attained for these children. After all, if there is any great responsibility about doing surgery it probably increases inversely with the age of the patient. The loss of an old man or an old woman is not nearly so regretful as the loss of a baby or a young child.

UNUSUAL MANIFESTATIONS OF CORONARY HEART DISEASE*

THOMAS H. DELAUREAL, M. D.

LAKE CHARLES

The recognition of coronary heart disease in all of its clinical manifestations is the ultimate aim of all clinicians. We are all familiar with the typical cases described in our textbooks, such as those with substernal pain radiating to the left shoulder and arm; those suffering with angina pectoris which is relieved by nitroglycerin; the individual with a severe substernal or precordial pain with its associated drop in blood pressure, elevated white count and a slight elevated temperature as in coronary thrombosis; and also, the acute pulmonary edema of the congestive heart failure. These cases, which are so well described in our textbooks, and with which all of us are very familiar, unfortunately do not cover all of the cases that we encounter in our practice. Some of the manifestations, less common than the classical ones, are those in which we are interested at this time.

An effort to get to the root of an ob-

scure symptom, particularly symptoms arising from the heart, requires a very detailed history, and by process of elimination symptoms are ruled out one at a time, after which we resort to our physical examination and usual laboratory aids. Details are obtained, such as symptoms being brought out following effort, during exposure to cold weather, etc. Because of the many possibilities in the differential diagnosis, a short cut can sometimes be obtained from the family history, which might immediately unveil the picture of a possible cardiac condition because of a well known tendency for certain families to develop cardiovascular disease.

In addition to the history, the physical examination will frequently reveal some clues that might clear up a questionable situation in the absence of definite blood pressure changes and obvious heart abnormalities. The middle-aged, square-chested individual is well known to all of us as well as the obese patient. One observation from the physical standpoint which might bear more detailed study is the prematurely grey individual, of whom I had two very recently who turned out to have myocardial disease.

One of the most difficult situations to

*Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.

analyze is that in which the patient complains only of weakness. This symptom can be extreme and the patient will frequently state that the slightest exertion makes him feel as though he had done a hard day's work. It is a symptom similar to that which we encounter in a post-pneumonic state or immediately following moderately severe or severe influenza. During the course of any illness a complaint of weakness beyond the usual expectancy in that case should lead one to suspect the possibilities of heart disease. A fainting spell in a previously well individual frequently may be the first sign of heart trouble.

Pain is by far the most common complaint at the onset of coronary thrombosis. The majority of these patients will leave no doubt in your mind when the location of pain is substernal, precordial, or across the epigastrium. Apparently pain can radiate to almost any part of our anatomy. Some individuals with coronary heart disease may manifest gastrointestinal symptoms only, complaining of epigastric pain, pain in either upper quadrant of the abdomen even to the extent of having a rigid upper abdomen to make you think of a ruptured ulcer, as in one case that I remember so vividly. A delay for observation and the development of a friction rub saved this man an exploration. Gallbladder disease is frequently found in a cardiac patient. Pain from the gallbladder will often be radiated substernally. Shoulder pains frequently offer a challenge to your diagnostic ingenuity, particularly these individuals with an acute bursitis or calcified tendons which causes a pain not only in that site but involving sometimes the whole upper half of the chest. Recently, I had occasion to see a man with bilateral calcified subdeltoid bursitis and calcified tendons with severe pains across the upper chest. The idea that all chest pains are cardiac in origin until proven otherwise is a good idea, provided adequate steps are taken to prove or disprove the possibility of heart disease. It might be best to say that all chest pains are not due to heart disease, certainly for the benefit of the patient, as he is already

convinced that he has something wrong with his heart. Because of the obscure radiation of pain it is safer to consider chest pains as cardiac in origin unless you can readily account for such pain at the time of your initial examination. The radiation of pain to the lower extremities is not uncommon and should be considered even in such conditions as sciatica, as we have known of sudden deaths during the course of observations or treatment for such pains, which at autopsy revealed the presence of a coronary thrombosis which had apparently existed for some period of time.

I would like to present briefly some cases which were obscure at the onset and after observation and detailed study revealed the true nature of the illness.

CASE REPORTS

Case No. 1. A white female, age 55, consulted a physician because she had had an attack of indigestion the night before and was still a bit uncomfortable. The indigestion consisted of a feeling that she had a "knot in the pit of her stomach," and a great deal of belching. She left the physician's office with a prescription for one of the more popular anti-spasmodics and within a few days the symptoms disappeared. Two months later she was seen by me for a routine health check and an electrocardiogram made at that time showed pathognomonic evidence of an anterior myocardial infarction. No treatment was offered except advice as to limitation of activities.

About six months later this same patient suddenly felt very faint and suffered an attack of syncope accompanied by a profuse cold sweat. She was seen in this state within fifteen minutes of the onset of the attack. Her pulse was of low tension and poor volume and the blood pressure was 90/60. She had no pain and was under the impression that she had simply fainted. An electrocardiogram was made immediately. It showed pathognomonic evidence of a fresh posterior myocardial infarction. The subsequent course was typical with fever and leukocytosis.

This patient then had two attacks of myocardial infarction, one without any pain at all, the other with gastrointestinal symptoms of such a nature that neither the patient nor the physician considered that they might be cardiac.

Case No. 2. A white male, age 58, was admitted to the hospital complaining of paroxysms of cough and marked weakness. For a period of four months he had had a severe sinus infection and was under treatment. A mild cough which had accompanied the sinusitis became more severe one week before he came under observation. When first

seen this patient appeared disorientated, temperature was 101° F. blood pressure 88/50, pulse rapid and of poor volume. Coarse rales were heard throughout the whole chest. A blood count revealed 20,000 white cells. An electrocardiogram revealed evidence of posterior coronary infarction. On the second day of hospitalization he developed an auricular fibrillation which cleared up after forty-eight hours. Ten weeks later he had recovered sufficiently to be allowed out of bed. This patient has never complained of pain. His only complaint throughout his illness was of weakness.

Case No. 3. A white male, 27 years of age, reported to the office with a complaint of pain in the chest on exertion. The pain lasted five to ten minutes and was relieved by rest. The symptoms were so typical that a layman advised him to consult a physician because "it sounded to him like he had angina". Closer questioning brought out the following past history: While the patient was in basic training in the Army he became ill suddenly one day with pain in both shoulders. By next morning he had temperature of 102.5° F. and was put in the station hospital. The pain in the shoulder continued. X-rays were made of his chest as well as all sorts of blood tests. The elevated temperature disappeared in two weeks and he was discharged from the hospital one week later. He was told by the medical officer that they had never found out just what had been wrong with him. He was returned to duty and then served in the European theater as a combat infantryman for over a year, having no difficulty except slight pain in the shoulders during time of great excitement. This pain he paid no attention to at all.

The electrocardiogram made in the office showed pathognomonic evidence of an old posterior myocardial infarction. There can be little question but that the obscure illness which he had during his basic training was a myocardial infarction and that he served as a combat infantryman for over a year after that event.

Case No. 4. A white male, 39 years of age, was first seen in consultation February 20, 1948, at which time he complained of substernal pain on effort. This condition had existed for approximately sixteen days prior to our first seeing him. His physician had prescribed nitroglycerin because of the suspicion of a probable angina pectoris. There were no other complaints. A blood count was normal. Blood pressure was 128/88. An x-ray of the chest revealed normal findings. An electrocardiogram failed to reveal any abnormality. Two days after first seeing the patient he was hospitalized because of severe pain in the left upper chest with point tenderness in the second interspace in the anterior axillary line. This pain was constant, was accentuated by pressure and movement of the left shoulder girdle caused more acute pain. A few days after admission to the hos-

pital he developed acute pain between the left axillary lines and a friction rub was detected. There were symptoms suggestive of a diaphragmatic pleurisy and the clinical course resembled a lower left lobar pneumonia. An x-ray of the chest at this time revealed evidence of consolidation of the lower left lobe. A few days later the patient died very suddenly. An autopsy revealed a marked thinning out of the myocardium at the apex of the heart and a soft scar in this thinned out area indicating a recent coronary thrombosis. Attached to the wall of the left ventricle were many small clots which probably accounted for the pathological report of pulmonary embolism.

A thorough study consisting of a good history and physical examination along with laboratory aids such as blood counts, electrocardiograms, venous pressure, vital capacities, etc. will often clarify a situation which would otherwise be missed. The reliance on diagnostic points is important. The reliance on one or more negative findings, as for instance in using the electrocardiogram, frequently leads to grave errors. In one of the cases mentioned above the diagnosis was made before the autopsy, because of the possible causes of sudden death in such a case.

SUMMARY

Individuals previously in a good state of health, or who during the course of an illness manifest unusual weakness; or patients with obscure chest and upper abdominal complaints, which cannot be readily accounted for, should be carefully studied from the cardiac standpoint.

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THE SURGICAL MANAGEMENT OF UTERINE RETRODISPLACEMENTS

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AND

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During the past decade or more surgical treatment of uterine displacement has apparently fallen in popularity. It is the judg-

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ment of these authors that this fallen popularity is unjustified. When the surgical correction is properly applied, it has a very definite place in the treatment of uterine displacement.

With this idea in mind, one of us reviewed the charts of all the uterine suspensions done in Charity Hospital during the past five years, 1943 through 1947. The cases represent all of the three services and were done by many operators, visiting and resident.

This study was undertaken to ascertain the number of operations, the indications for surgery, and the final results as to successes or failures.

There were 219 uterine suspensions done, but 26 were employed incidental to a surgical procedure on the adnexa. These cases are excluded from the study. The remaining 193 cases are reviewed.

In this period there were approximately 6250 major gynecological procedures. Uterine suspension comprised 3 per cent of the operations.

TABLE 1		
RACE AND AGE		
TOTAL 193 CASES		
White—125		Colored—68
Number	Age	Per cent
10	14-19	5
136	20-29	70
46	30-39	24
1	42	5
Average age—25		

Table I lists the cases according to race and age. One hundred twenty-five were white and 69 were colored. The low incidence in the colored race can be explained on the basis that in the negro pelvic inflammatory disease and myomata are frequently seen, and it is unusual to be able to handle such cases with conservative surgery; 136 or 70 per cent of the patients were between the ages of 20 and 29. The limits were 14 and 42, while the average was 25 years which is a bit lower than the average reported by Gardner on his private cases.¹

The chief complaints of all the patients are shown in Table 2. It was rare to have only one complaint. The three most com-

TABLE 2	
CHIEF COMPLAINTS	
Low abdominal discomfort	144
Backache	118
Dysmenorrhea	54
Menstrual disturbances	52
Stress incontinence	26
Dyspareunia	18
Vaginal discharge	16
Sterility	5

monly associated were low abdominal discomfort, backache, with dysmenorrhea and menstrual disturbances following in close order.

There are over a hundred different types of suspensions. The most popular type at Charity Hospital is the modified Gilliam (Table 3) in which the round ligaments are brought through the internal abdominal rings and sutured to the under surface of the anterior rectus fascia. In addition, however, to the procedure on the round ligaments, the uterosacrals are plicated onto the posterior surface of the uterus. This combined procedure was employed in 81 per cent of the cases.

TABLE 3		
TYPES OF SUSPENSION		
Modified Gilliam with plication	157	81%
Modified Gilliam without plication	31	
Norris suspension with plication	2	
Reefing round ligament	1	
Baldy Webster with plication	1	
Gilliam without plication	1	

In order to evaluate the results of the treatment, the cases were divided into the methods of handling so that we could determine whether suspension alone is sufficient to relieve the suffering patient. The criterion for good results was complete relief from all complaints. Follow-up period averaged eleven months for all patients. Naturally those done in 1947 did not have this average follow-up except those in the first part of the year. The results are informative (Table 4); 74 per cent or 62 patients who had plastic repairs in addition to uterine suspension were relieved; whereas only 66 per cent or 36 patients were cured who had suspension alone. We believe the difference is significant.

TABLE 4
193 CASES RETROVERSION
Results according to handling

	Total-cases		Good		Fail- ure	No fol- low- up
Suspensions only	54	27%	36	66%	13	5
Suspension with trt. to cervix	38	18%	25	65%	8	5
Suspension with procedure on adnexae	9	4%	5	55%	3	1
Suspension with pre-sacral neurectomy	9	4%	5	55%	3	1
Suspension with plastic	83	43%	62	74%	19	2
TOTAL	193		133	68%	46	14

Next we decided to investigate the reasons for the failures, and these are listed in Table 5. Of the 46 failures, 23 or 50 per cent were failures to correct prolapse and/or relaxations. In other words, the surgery was not adequate. Eight failures were seen in nulliparous patients who had no previous trial with a pessary. In this group of failures was the fourteen year old girl who only had a retrocession. Certainly in this case it is felt that a suspension procedure was not indicated.

TABLE 5
REASONS FOR FAILURE

Failure to correct prolapse and/or relaxations	23
Nulliparas without pessary trial	8
Unknown	6
Cervicitis not treated	5
Pessary gave no relief	2
Symptoms due to orthopedic condition	1
Round ligaments too tight	1

It was interesting to note that only one case of endometriosis was seen at the time of laparotomy in all these cases. This condition is said to be associated often with uterine retroversion; yet it is seldom seen at Charity Hospital.

DISCUSSION

The number of operations, 193, is relatively small (3 per cent) when one considers the total number of other major gynecological operations performed during this

same period of time, and apparently the surgery was only used in that small number of cases in which permanent retrodisplacement resulted from structural damages to the fixed and sustaining elements that keep the uterus in its normal position. This surgery is intended to give prompt and permanent relief when pessaries fail to hold the uterus because of inadequate structural supports, or for any other reason that makes the pessary inadvisable.

It is our contention that the disfavor which this operation is enjoying results from the misapplied term round ligament suspension, or plication, leaving with the surgeon the idea that plication or suspension of the ligaments will correct permanent displacement. A better understanding of the factors involved that keep the uterus in a position of antelexion would at once lead to the discarding of all simpler plication or suspension procedures as totally inadequate.

The uterus is mobile; its normal position is one of moderate antelexion, but it may change its position, for various reasons, within an arc of 180°. The uterus is suspended and supported in this position by a mechanism which consists of an upper or suspensory level, the round ligaments and broad ligaments. The round ligaments, composed of connective tissue and muscle fibers, extend from the cornual end to the inguinal canal and serve as the ridge-poles of the tentlike structure known as the broad ligament. These two structures, round and broad ligaments, merely suspend but do not support the uterus.²

The true supporting structures³ in the lower one-third of the uterus consist of anterior pubocervical fascia, posterior uterosacral, and the lateral cardinal ligament which fuse with one another and form an elastic sling for maintaining the uterus in its normal position. The uterus is further supported by the perineal body which maintains the normal posterior curve of the vagina, which curve, if not maintained, will allow the uterus to descend carrying its supporting structures along with it.

It therefore can be seen that any opera-

tion merely manipulating the broad or round ligaments in any manner whatsoever—shortening, plication, reduplication—cannot possibly maintain the uterus in the normal position if the more important structures are deficient. The inadequacy of the so-called suspension operations has been responsible for many of the failures and complications that have resulted from their use.

Surgery is only indicated in the acquired symptomatic retroversion, and in all cases the complete operation should include the restoration of the pelvic floor, perineorrhaphy; the plication of the pubocervical fascia in order to correct the relaxed anterior and posterior wall; shortening of the cardinal ligaments by plication of the anterior aspects of the uterus or by intra-abdominal plication, as may be most convenient. Shortening of the round ligaments by some sort of suspension is of some help. In many instances the bladder peritoneum may be advanced high on the fundus of the uterus in order to help maintain the anterior position of the uterus.

SUMMARY

1. One hundred ninety-three cases of uterine suspensions at Charity Hospital during 1943-1947 are reviewed as to indications for surgery, and the final results as to successes and failures.

2. A brief discussion as to the supporting and suspending structures of the uterus is given.

CONCLUSION

Prompt and permanent relief of symptomatic acquired retroversions can be attained by surgery if adequate surgery is done. This consists in correcting the retroversion by a suspension procedure and also by correcting the associated damage to the real supporting structures of the uterus, namely, the cardinal and uterosacral ligaments, the anterior pubocervical fascia, and the perineal body. Mere plication or shortening of the round ligaments is not complete surgery.

We wish to acknowledge our thanks to Conrad Collins, M. D., and Adolph Jacobs,

M. D., who allowed us to review the charts of the Tulane and Independent services, respectively.

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DISCUSSION

Dr. Howard P. Hewitt (Lafayette): I think the doctor's paper is very timely and I do not like to disagree with the professors, but this is one time that I am compelled to disagree with them. I would like to give you the opinions of a one gallous, two by four country doctor.

What is it that maintains the poise and position of the uterus?

1. The ligaments:
 - a) Broad
 - b) Round
 - c) Uterosacral
2. Intra-abdominal pressure.
3. Paracervical, paravaginal fascia.
4. Pelvic floor.

Since the uterus is only fixed at the cervix a full bladder will displace the uterus backward, and a full rectum will displace the uterus forward.

Retrodisplacements of the uterus:

1. First degree retroversion: The fundus is on a level with the promontory of the sacrum and the cervix is in the midline axis of the vagina.

2. Second degree retroversion. The fundus is in the hollow of the sacrum and the cervix points toward the symphysis.

3. Third degree retroversion: The fundus is at the level of sacrococcygeal junction and the cervix points behind the symphysis.

Also, in retrodisplacement we can have some degree of retroflexion which would change the axis of the cervix to the vagina.

Table 1 shows the positions of the uterus in the last 300 patients seen at the Gynecological Clinic at Lafayette Charity Hospital. This includes both white and colored, both postpartal and gynecological patients.

TABLE 1
POSITION OF THE UTERUS

	No. Cases	Percentage
Acute Antelexion	2	.6
Antelexion	70	58
First Degree Retroversion	80	27
Second Degree Retroversion	34	11.4
Third Degree Retroversion	10	3
	300	100

Ninety per cent of patients with third degree retroversion have no symptoms whatsoever as a result of the retroversion. Of the remaining 10 per cent other pathology counts for the symptoms such as pelvic inflammatory disease, tumors, etc.

TABLE 2
CASE REPORTS

Race	Age	Marital Status	No. Children	Symptoms	Diagnosis	Operation
W. F.	17	Single	0	Dysmenorrhea	2nd degree retroverted uterus	Kelly-Simpson
W. F.	20	Single	0	Dysmenorrhea	Anteflexed, uterus 1st degree prolapsed	Kelly-Simpson
W. F.	42	Married	6	Pain in both sides	Chronic salpingitis; 2nd degree retroverted uterus	Kelly-Simpson
W. F.	36	Married	4	Pain in back and both sides, leukorrhea	Relaxed perineum lacerated cervix. 3rd degree retroverted uterus	Ant. & Post. Repair, D. & C. Cauterization of cervix, bilateral salpingectomy Kelly-Simpson suspension

Of these 10 cases in the Clinic of third degree retroversion all were treated with insertion of a pessary, and in half of them after wearing the pessary six weeks, the uterus was in anteflexion, and in the other half there was first degree retroversion and no symptoms.

TABLE 3

NUMBER SUSPENSIONS DONE AT LAFAYETTE
CHARITY HOSPITAL FROM 1941-1948

1941	39	
1942	22	
1943	14	
1944	1	For teaching purpose only.
1945	0	
1946	1	For teaching purpose only.
1947	1	For teaching purpose only.
1948	0	

TOTAL 78 White, 71; Colored 7.

Ages: 17-42

77 Operations—Kelly Simpson

1 Operation—Baldy Webster

Table 2 shows not what to do but what you should not do. The doctor states that there are one hundred different types of operations for sus-

pension of the uterus. This alone proves to me that there is no way to do a suspension as there is only one way to do anything right. Also, I notice that one of the cases in the doctor's series was done with one of the indications being dyspareunia. To me the difference between dyspareunia and libido is a question of salesman-ship, and I am at a loss to understand how a suspension operation will relieve this complaint. Personally, I have never done a suspension operation. I have never seen a case in which I felt that the operation was indicated, even using the criteria that is given by the men who do the operation. I am inclined to place the operation in the category of the 75 per cent useless elective operations. I had not heard of the operation for the past ten years until I came to the State of Louisiana.

In closing, I would like to quote a personal communication from Dr. Carter who is Professor of Obstetrics and Gynecology at Duke University: "I will not allow any type of suspension done on any ward or private patient so long as I am in charge of Obstetrics and Gynecology at Duke."

STELLATE BLOCK: INDICATIONS
AND A NEW APPROACH*ROBERT M. ROSE, M. D.†
NEW ORLEANS

Patients complaining of pain in the upper extremity are familiar to us all. The cause of this pain may be obvious, as in a recent fracture, or it may be obscure as in causalgia. Regardless of the etiology of the pain, relief for a variable period may nearly always be obtained by means of procaine

block of the stellate ganglion on the affected side.

The exact reasons for obtaining this relief are not completely known, but one fact is made obvious by the results obtained, and that is that the autonomic nervous system is in some way directly concerned with the transmission of pain impulses, for by blocking the pathway through this system variable relief of pain is obtained.

We are all familiar with the division of the autonomic nervous system into the sympathetic or thoracolumbar and the parasympathetic or craniosacral sections.

*Read at meeting of the Orleans Parish Medical Society, December 8, 1947.

All peripheral nerves are accompanied by fibers of the sympathetic system. All impulses going over these fibers arise or terminate in the thoracic and lumbar segments of the central nervous system. The three cervical sympathetic ganglia all receive their impulses through the first thoracic sympathetic ganglion. When this first thoracic ganglion is fused to the inferior cervical ganglion the two together are referred to as the "stellate ganglion." By recent common usage the first thoracic sympathetic ganglion is generally referred to as the "stellate ganglion." Regardless of the name, it is this first thoracic sympathetic ganglion that is blocked in order to paralyze all sympathetic fibers going out over the brachial plexus.

In the past three years I have had occasion to utilize these blocks in over three hundred varied cases and as is true of all forms of treatment some conditions have been found to respond more favorably than others. The following conditions are those in which the response is such that the use of blocks should be given serious consideration.

Contusions and Crushing Injuries

The diagnosis in these cases is obvious. The pain, often severe is commonly treated by narcotics and it occasionally becomes difficult to wean patients from these drugs. The use of blocks will not only markedly decrease or totally abolish the pain felt but by also improving the blood supply will decrease swelling and promote healing.

Fractures and Dislocations—Post-Reduction Pain and Swelling

Painful swelling of the hand following fracture reduction and application of a cast commonly occurs. Treatment usually consists of elevation of the part, sedation, and sometimes splitting of the cast. If stellate blocks are performed on these patients the pain is usually completely relieved and the swelling markedly decreased. The same is true of dislocations that have been reduced and splinted. There is but one exception. The blocks will not compensate for a faulty cast. If pressure areas or constrictive bands

are present do not expect the blocks to alter the plaster.

Subdeltoid and Subacromial Bursitis

These conditions are characterized by the old familiar group of calor, dolor, rubor and tumor about the shoulder. There is in addition limitation of shoulder motion caused by pain. Treatment usually consists of deep x-ray, or of local needling and novocaine infiltration, diathermy and exercise; for the most part with good effect in one to two weeks. The results obtained by means of stellate block in these cases is almost without exception so rapid and so complete that you will only believe it when you see it for yourselves. Repeat blocks are seldom required for these cases.

The Anginal Syndrome

Many patients experiencing repeated anginal attacks complain bitterly of the pain referred to their arms and shoulders. Because of pain the arm is often held close to the body and not used. Within a week these cases may develop a "frozen shoulder" and the pain and dysfunction continues but now from a different cause. This condition may be confirmed by noting the limitation of shoulder abduction and the almost complete absence of external rotation.

A number of physicians look upon anginal referred pain as a warning signal to the patient and are hesitant about methods of relief. In cases where the pain is intractable and the patient is developing a "frozen shoulder" something should be done. Stellate blocks will give them relief for which they will be grateful. What part the sympathetic cardiac nerves play in this I do not know, for they are also blocked by the procedure. The point is that the pain can be relieved without risking injury to the patient's cardiac status.

Diffuse Myositis

Patients experiencing pain along a muscle group, usually following exposure, an infectious process, or some form of muscle injury are ordinarily treated by sedation, diathermy, and physiotherapy. Relief may be accentuated by the use of blocks. The

results in this group are not as dramatic as in the other conditions mentioned.

The Scalenus Anticus Syndrome

Some authorities deny the existence of this syndrome and I wish that I could agree. There is no doubt but that some of the cases have been misdiagnosed but then there are others that closely fulfil the criteria. In these cases the scalene muscles may be felt as hard and fibrous, almost woody in consistency. Physiotherapy, which occasionally gives relief initially will in the long run not improve the condition. Blocks in these cases give but transitory relief and that is why they are important. If satisfactory relief is obtained the patient does not have the syndrome.

Posttraumatic Causalgia

These patients have often had a trivial blow to the region of the hand or wrist and little or no initial pain or trouble. Some days to weeks later they begin complaining of constant pain which may be severe enough to prevent use of the hand. Physical examination, x-rays and laboratory findings are uniformly negative. Relief in these cases is usually complete when blocks are performed. Repeat blocks may be neces-

sary and if they are the patient usually asks for them.

The Frozen Shoulders

This condition has already been mentioned under the anginal syndrome. It more commonly results from the peri-arthritis following an acute subdeltoid or subacromial bursitis or from injuries in the region of the shoulder. In these cases pain relief is good but repeated blocks are necessary. The increase in range of shoulder motion is superior in these cases when blocks are used over conventional methods of treatment. For best results the blocks should precede physiotherapy.

Technic:

There have been many technics devised for performing these blocks and they have commonly followed direct anterior, anterolateral or posterior approaches. All of these are a bit difficult and quite risky and a mortality rate has been attached to the procedure. There is, however, a simple lateral approach in which we do not try to directly infiltrate the area about the ganglion but rather infiltrate the region of the middle cervical ganglion. The ganglion chain is in a common sheath and by infil-

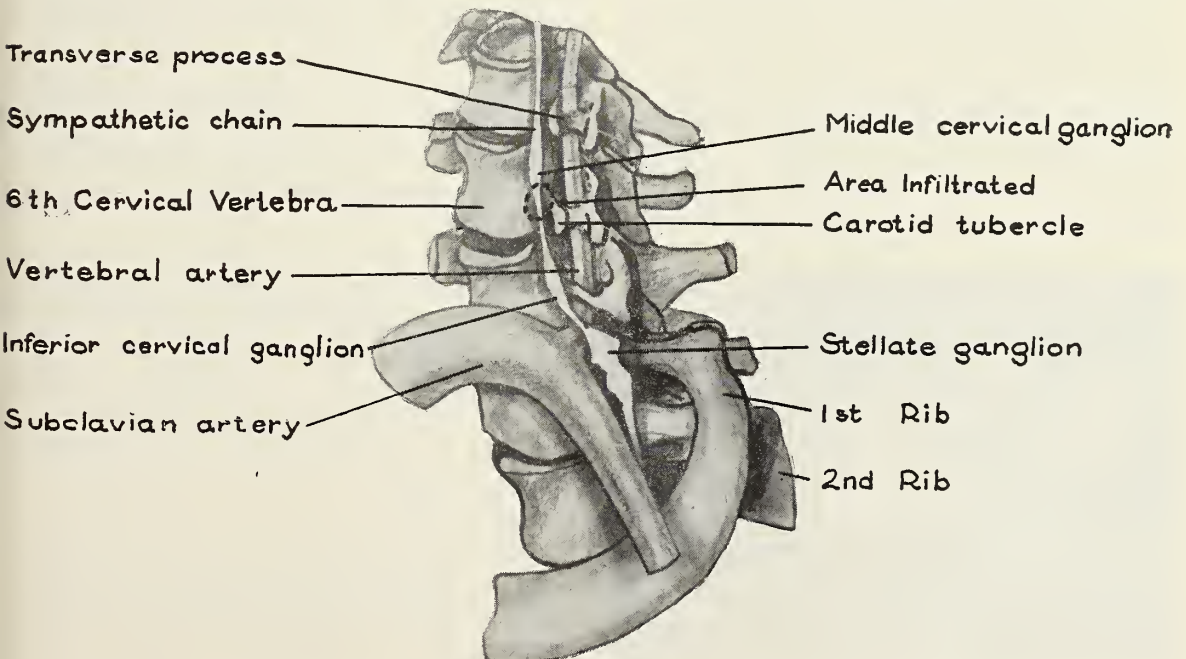


Figure 1. Skeletal relations of the sympathetic ganglion chain and the vertebral artery

trating into this sheath at a higher level and sitting the patient up we can anesthetize the stellate ganglion without putting a needle in close approximation to it.

Figure 1 shows the skeletal relations of the sympathetic ganglion chain and the vertebral artery. The carotid tubercle which is the anterior tip of the transverse process of the 6th cervical vertebra is our main landmark. This is palpable in the neck about $1\frac{1}{2}$ inches above the junction of the inner and middle thirds of the clavicle on palpating through the anterior scalene muscle just beneath the clavicular head of the sterno-cleido-mastoid muscle. Our needle picks up this point and we work the tip medially along the transverse process for about $\frac{3}{8}$ th of an inch and then bring it anteriorly about $\frac{1}{8}$ th inch to get within the sympathetic sheath. The vulnerability of the vertebral artery when other approaches are used is apparent. The cupola of the lung is not shown on the diagram but it domes upwards from the inner edge of the first rib so that the stellate ganglion is in a groove between it and the neck of the rib. That is why pneumothoraces may be obtained when conventional anterior and antero-lateral approaches are used.

In performing the block the patient lies on his back with his head on a low pillow, his face turned away from the side being injected as in Fig. 2. The neck is palpated and the location of the tubercle of the 6th cervical transverse process determined. The area is then prepared and draped. A 10 cc.



Figure 2. Site of injection in stellate block.

syringe is filled with 2 per cent novocaine and a skin wheal raised with a hypo needle. The needle is then changed to a $1\frac{1}{4}$ in. 24 gauge one. The index finger of the other hand is placed over the tubercle and pushed inwards and upwards, displacing the carotid sheath structures and making the tip of the tubercle practically a subcutaneous structure. This bony point is then picked up by the needle which is worked into position as previously described. The needle is then held in this position while the finger displacing the neck structures is released. The syringe is removed from the needle and the drop of fluid remaining in the hub watched while the patient inspires deeply. If a vein or artery has been entered blood will well out. If, by any quirk the spinal canal has been entered clear fluid will well out. If the needle is too low and the pleural space has been entered the fluid in the hub will be sucked in. In either case, discontinue the procedure. If all is well, re-attach the syringe and inject about 1 cc. Watch the patient for about one minute for any adverse reaction. If after this time conjunctival injection is noted you know that the needle is correctly placed and 3 to 4 cc. of the remaining novocaine is slowly injected. If the conjunctival injection is not noted, move the tip of the needle slightly, recheck as before and inject 1 cc. until the injection is noted. Immediately after completing the entire injection sit the patient up so that the novocaine will gravitate down the sheath and reach the stellate ganglion.

If a satisfactory block has been performed the first change noted will be the conjunctival injection followed by the appearance of Horner's syndrome: Ptosis, myosis, enophthalmos and anhydrosis. The hand of the blocked side should become quite warm and the patient will experience relief of pain.

Precautions:

As in all surgical procedures there are certain reactions and accidents that may occur. With proper care these may be minimized.

1. The patient should always be ques-

tioned for possible sensitivity reactions from preceding novocaine injections such as a tooth extraction.

2. Seconal grs. 1½ or one of the quick acting barbiturates should be given at least thirty minutes prior to the procedure to ward off novocaine reactions. If a reaction does occur intravenous barbiturates should be given immediately. Therefore intravenous sodium amytal and the means of giving it should be on hand before starting the procedure.

3. If a bloody tap is made or the pleural space or the spinal canal is entered the block should be postponed.

4. Never use over 25 cc. of 2 per cent novocaine in any block as this is the toxic limit of the drug. You will usually only require from 5 to 10 cc. Two per cent novocaine is better than 1 per cent as it more effectively penetrates the myelin covering of the nerves.

5. Never block both sides simultaneously. Occasionally the recurrent branch of the laryngeal nerve or the phrenic nerve is blocked. You would not want to do this bilaterally.

6. On the left side do not bring the needle in too horizontally or the esophagus may be punctured.

These various accidents should not happen if the technic given is closely followed.

There is one other reaction which you will be sure to see and that is the reaction to a needle. In these cases the patient complains of dizziness or feeling weak often before the procedure is done or any drug injected. This sort of performance is hard to distinguish from a mild reaction to the barbiturate. The only way is through knowing your patient.

In concluding, the following general prognosis as to results may be drawn. The more recent and acute the painful condition complained of, the more striking and complete will be the relief obtained through blocks. The more chronic the condition, the shorter will be the duration of pain relief, and repeated blocks will be necessary to obtain the final desired result.

AN UNUSUAL CASE OF A FOREIGN BODY IN THE ESOPHAGUS

J. R. HANLEY, M. D.

and

J. P. SWEARINGEN, M. D.
NEW ORLEANS

This is a case which is not at all infrequent, the swallowing of a coin with lodgment in the esophagus. Although this type of foreign body in the food passages is considered one of the commonest types, this case is atypical in the position assumed at the site of lodgment.

CASE REPORT

An 80 year old colored female was first seen in the accident room of Charity Hospital at 3:00 P.M. on January 3, 1948, complaining of some difficulty in swallowing and substernal discomfort. Her present illness began at 7:00 A.M. when she became aware of the fact that a 50 cent piece which she placed in her mouth the night before was missing. The patient then assumed she had swallowed this coin and made several attempts to cough it up without any success. After eating a light breakfast consisting of dry toast and coffee, the discomfort in her chest continued and she decided to come to the hospital. Prior to this there was no history of attacks of choking, gagging, dysphagia, aphagia, dyspnea, or involuntary coughing.

The review of other systems, family and social histories was non-contributory.

The past history revealed that the patient had a habit of sleeping with some kind of a coin in her mouth.

The patient was then admitted to the ward with a temperature of 98.4° F., pulse rate of 92; respiratory rate of 20; and blood pressure 190/100.

A cursory physical examination revealed only slight cardiac enlargement downward and to the left, with a prominent P.M.I. and a short systolic murmur in the aortic area. The urinalysis was normal. EPA view of the chest showed slight cardiac shadow enlargement and a disc-shaped opaque foreign body in the midline in the region of the aortic knob which was thought to be the coin which the patient swallowed. At this time additional films were ordered to include another EPA and a lateral view.

Since it was doubtful as to the exact location of the foreign body and the chest X-rays showed the edge of the coin erect, in the sagittal or anteroposterior plane, bronchoscopy was considered primarily indicated. The patient was premedi-

Presented at meeting of the Eye, Ear, Nose, and Throat Staff, Charity Hospital of Louisiana, New Orleans, March 17, 1948.

cated with morphine sulfate gr. 1/8, atropine sulfate gr. 1/150, and sodium luminal grs. 2, and using 4 per cent cocaine topical anesthesia a bronchoscopy was performed. After a thorough examination of the trachea and both main stem bronchi, the bronchoscope was withdrawn and an esophagoscopy was performed. During the latter procedure the coin was located at the level of the aortic arch lying now in the coronal or transverse plane. It was removed with ease and the patient returned to the ward in excellent condition. The following morning, January 4, 1948, she was discharged from the hospital.

This case is unusual since the roentgenogram of the chest revealed the coin situated in the sagittal or anteroposterior plane in the thoracic portion of the esophagus. It has long been taught that when a circular flat foreign body appears in the roentgenogram of the neck or chest, if its long axis stands in the anteroposterior position, it is probably stuck between the vocal cords, since this position corresponds with the long axis of the glottis. If the long axis of the object stands in the coronal plane it must be in the esophagus, since the long axis of the esophageal diameter is in the coronal plane. It must be remembered that the esophagus is only a potential cylindrical tube, compressed and flattened anteroposteriorly in the superior mediastinum, between the trachea in front and the bodies of the vertebrae behind. Actually the anterior and posterior walls of the esophagus are almost in complete apposition and are normally separated only by food or air.

Jackson and Jackson¹ explain the positions of this type of foreign body in the food or air passages in the following manner: "Coins and other disklike objects naturally lie in the frontal plane, because the shape and action of the tongue anteriorly combine with those of the posterior pharyngeal wall posteriorly to make the long diameter of the pharyngeal lumen transverse. On the other hand to enter the glottis, a flat object must lie in, or nearly in, the sagittal plane. In other words, the muscular activities of the pharynx throw flat foreign bodies into the frontal plane, whereas they must be in the sagittal plane to pass the glottis."

A case similar to this was reported by

Schwartz² in which a patient swallowed a 25 cent piece. It was assumed that the coin passed through the entrance of the esophagus in the usual manner, but somehow passed down the extreme left of the esophagus and rotated into the anteroposterior position, perhaps through striking the bulge of the arch of the aorta. Thus the posterior edge of the coin became wedged in an esophageal pocket, beside the body of a vertebra, while the anterior edge was similarly wedged in a pocket in the left of the trachea, with the left stem bronchus preventing the coin from passing further down the esophagus. This interpretation was confirmed at the time of esophagoscopy.

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THE SPECIFIC TREATMENT OF FRACTURED ANKLE*

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NEW ORLEANS

Fractures involving the ankle are probably the most common type of fracture of the weight bearing joints. Surgeons caring for these injuries are familiar with the therapeutic difficulties. In some types satisfactory reduction is difficult. Some types while easy to reduce are difficult to retain, especially over the period of time necessary for consolidation. Some fractures result in nonunion. Early weight bearing is beneficial in some, and harmful in others. It is the aim of this presentation to suggest definite therapeutic indications in the management of these fractures.

FRACTURES OF EXTERNAL MALLEOLUS

Simple fractures of the external malleolus without widening of the ankle mortice require immobilization in a plaster cast extending from the base of the toes to below the knee for a period of four to six weeks. Weight bearing may be permitted immediately. If obvious tibiofibular diastasis is

*Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.

associated with the fractured external malleolus, manual reduction is possible but prolonged retention by plaster of Paris is difficult. The diastasis tends to recur as the swelling subsides and the plaster becomes loose. This is especially prone to occur if early weight bearing is permitted. The treatment of choice is to insert a metallic transfixion screw through a small incision over the external malleolus that will firmly hold the tibia and fibula together in anatomical relationship. It is important that this be inserted with the foot held at a right angle so as not to interfere with subsequent dorsiflexion of the foot. The ankle is immobilized by a short leg plaster cast. Weight bearing is not permitted for at least three to four weeks in order to allow the ruptured inferior tibiofibular ligaments to heal. Immobilization is continued until union is evident by x-ray examination during which time weight bearing is encouraged. The screw as a rule does not require removal after consolidation has taken place.

In some cases the presence of tibiofibular diastasis is suggestive but not definite. It is advisable in this situation to repeat the x-ray examination under proper anesthesia with the surgeon manually attempting to displace the astragalus laterally on the fixed tibia.

Occasionally a fracture is encountered that involves the external malleolus and distal fibular shaft in which the proximal fragment becomes lodged behind the tibia. Manual reduction is impossible. Treatment consists of open reduction and reposition of the fibular fragments. The tibiofibular diastasis is then corrected by tibiofibular fixation with a transfixion screw.

FRACTURES OF MEDIAL MALLEOLUS

Isolated fractures of the medial malleolus are not common. These fractures are usually associated with fractures of the external malleolus, and frequently with fractures involving the posterior articular surface of the distal end of the tibia. If no displacement is present, immobilization in a walking cast is indicated until x-ray evidence of union is present. If the fragment is dis-

placed and if anatomic opposition cannot be obtained manually, open reduction is necessary. It will usually be found that a flap of fibrous tissue has become interposed between the fragments. This fibrous flap must be removed, the malleolus accurately replaced and fixed by a metallic screw to secure union. Displaced fractures involving the distal half of the medial malleolus should be excised to prevent nonunion.

FRACTURES OF BOTH MALLEOLI

Fractures involving the external and internal malleoli are generally caused by abduction or adduction strains. In abduction fractures the distal fragments together with the astragalus are displaced laterally and tibiofibular diastasis is present. Closed anatomic reduction of the abduction fracture is not always possible, and further it is difficult to maintain reduction in many instances. This fracture is best treated by open reduction and correction of the tibiofibular diastasis by a transfixion screw together with open reduction and internal fixation of the internal malleolus. The fracture can then be safely protected by a short leg plaster cast. Weight bearing should not be permitted for at least three to four weeks. Immobilization by a walking cast should then be continued until x-ray evidence of union is present.

In adduction fractures the distal fragment is displaced medially without tibiofibular diastasis. Closed reduction is usually possible and the fracture remains stable. Occasionally open reduction and internal fixation of the medial malleolus is necessary. Since tibiofibular diastasis is not a factor, weight bearing in a plaster cast may be started early and continued until union has occurred.

In fractures involving the external and internal malleoli without displacement, immobilization in a plaster of Paris cast below the knee is sufficient. Weight bearing may be permitted from the start and immobilization continued until there is x-ray evidence of union.

ANTERIOR AND POSTERIOR FRACTURES

Fractures involving the posterior articular surface of the tibia are common in

ankle injuries and are usually displaced. It is rarely seen as an isolated lesion. Fractures with displacement that involve less than one-third of the posterior articular surface of the tibia do not require reduction. If one-third or more of this surface is displaced, open reduction and internal fixation by a metallic screw inserted from a posterior approach is necessary to prevent posterior subluxation of the astragalus.

A type of ankle fracture involving the anterior half of the tibial articular surface and distal end of the tibial shaft is seen occasionally. It is usually due to falling forward and landing on the dorsiflexed foot. Considerable comminution of the fragments and anterior subluxation of the astragalus is usually present. The treatment of this injury is unsatisfactory. Closed reduction by traction and plantar flexion of the foot should be attempted. If unsuccessful and if comminution is not great, open reduction and internal fixation is indicated. Otherwise, the ankle joint should be arthrodesed primarily to avoid disabling traumatic arthritis.

SPRAINED ANKLE

The sprained ankle is a serious injury. In many instances the external lateral ligaments are completely ruptured. If this is

not recognized and treated as a simple sprain, the ligaments fail to heal and recurrent subluxation of the ankle results. In every severe sprain the patient should be put under an anesthetic, either local or general, the foot forcibly maintained in inversion, and an A. P. x-ray taken. If the x-ray does not show tilting of the astragalus out of the mortice, the ligaments are not ruptured and treatment by any method is adequate. If tilting of the astragalus is evident by x-ray, the ligaments are ruptured, and the ankle must be immobilized in a plaster cast for a minimum of six weeks during which time weight bearing may be permitted.

SUMMARY

The treatment of the fractured ankle should be designed to restore and maintain anatomical relationships of the displaced fragments whenever present. This is best accomplished by open reduction and screw fixation especially when tibiofibular diastasis is present. Fractures without displacement or those with displacement but without diastasis can be adequately treated by closed methods. Recognition by special roentgenography of rupture of the lateral ligaments in sprained ankles is necessary and adequate treatment to prevent recurrent subluxation of the ankle is essential.

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A SURVEY OF THE STRUGGLE AGAINST STATE MEDICINE

The physicians of this nation now face the prospect of state taxation for universal medical care. The proposals for such a plan in previous years have taken the form of bills in Congress which were given a sympathetic reception by the administration, but were not a part of the party program. Now the situation is different.

The President has repeatedly stated his desire for such legislation and while it was not in the party platform it is in the legislative program of the leader of the party. It is understood the leader has what

amounts to an obsession to see this program in law. We are intimately concerned to know what are the chances of such laws being enacted. It is clear that a party majority would be expected to support a party measure if the individual members expect any patronage. It is also clear that those members of Congress who supported the Dixiecrat ticket are more needed now by the administration than they were before the recent election. Many of these members of Congress from the South may have personal dislike for state medicine, but may have a desire to vote for it if they think a majority or even a vociferous minority of their constituents wants it.

In the national polls, which were uniformly wrong, about 7 to 11 per cent of those individuals interviewed were "undecided". It is now seen that these were the ones who determined the course of the election.

It must be recognized, however, that the Democratic party plurality has declined in each presidential election year since 1936, when it was seven million, to 1948 when it was only two million. Still more important is the fact that half the eligible voters did not vote at all.

Accordingly, we, as doctors, must not assume that the cause of freedom is lost and that each election pushes us reluctantly down "the road to serfdom". Actually the doctrine which says in effect let the strong carry the weak until they both drop is losing votes at each election. The well organized minority is still in control. The power of this administration, so far as medicine is concerned, could be weakened even at this hour if consistent opposition were directed against it. We have to help the undecided group to make up their minds and to tell the forty seven million citizens who did not vote, that American medicine is about to be undermined and that presently their liberties will be in even greater danger.

Such a program must be national, state and local. Up to the present the educational program has not been effective and national leadership has been unaggressive. We must reach the average voter. The state

societies can initiate such a program; the local societies can then give it expression. As a major part, the Auxiliary which has already been of great service should be further assisted.

In Louisiana we have a good start in dealing with the community aspects of medical care. Educational programs have been going on for several years. More recently the Council on Medical Service and Public Relations of the Louisiana State Medical Society has presented an excellent program calculated to reach those people who know little of the problem they face. Hospital and surgical insurance is becoming increasingly available. Our system of charity hospitals

supplies assistance to a portion of the population that only taxation can provide for. We learn that as a result of these measures the representatives of our state in Congress have less clamor around their ears for state medicine than any other state group.

The most persuasive resource of all is yet to be utilized. This is the opportunity the physician has to explain the situation to his patients day by day. When each doctor discusses the problem with each patient over the whole nation within a year the undecided voter will know his interests and the sleeping citizen will have less lethargy. After this the men in Congress will know how to vote.

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ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

REPORTS TO EXECUTIVE COMMITTEE

INTERIM MEETING OF AMERICAN MEDICAL ASSOCIATION

The Third Interim Meeting of the American Medical Association was held in St. Louis on Tuesday, November 30, and Wednesday, December 1, 1948.

On the first day the House was called to order by Speaker Borzell at 10 a. m. sharp. The Reference Committee on Credentials reported 129 delegates certified at that time with more registering continuously.

The next order of business was selection of the recipient of the general practitioners' award. Twenty-three names, from twenty-three states, were submitted to the Board of Trustees, from which they selected three names for presentation to the House of Delegates. Louisiana was honored by having its representative, Dr. Charles M. Horton, among those presented to the House of Delegates, however in the voting Dr. W. L. "Buck" Pressly, of Due West, South Carolina, received the highest num-

ber of votes and was declared the recipient of this year's award.

During the address of the Speaker, the committees were appointed and Dr. James Q. Graves was appointed to the Blood Bank Committee and Dr. Val H. Fuchs was appointed to the Reference Committee on Amendments to the Constitution and By-Laws.

The first certificate and gold medal given to a layman by the AMA was awarded to Dean Alphonse M. Schwitalla, S. J., for his "services to the public welfare and American Medicine on a national level."

The rest of the morning session was spent in receiving committee reports until recess at 12:20 p. m. for lunch.

The afternoon session began at 2:00 o'clock and a number of resolutions were introduced until adjournment at 4:55 p. m.

Wednesday morning was spent in committee meetings. Amalgamation of the Blue Cross and Blue Shield into a national insurance plan was discussed in open meeting for three full hours during which time the committee members heard pros and

cons before turning in their report to the House for action.

The afternoon session began at 1:30 p. m. One hundred and seventy-three delegates were certified. After an executive session to discuss some problems, the Committee on Changes in the Constitution and By-Laws reported changes clarifying and simplifying executive sessions. The House now considers three types of sessions with the following differentiation: 1. Open sessions, when anyone can be present, including laymen and newspaper reporters. 2. Closed sessions, when laymen and newspaper reporters are barred. 3. Executive sessions, when only duly elected officers of the AMA and certified delegates will be permitted to attend. It is felt that this last type of session will be necessary only on rare occasions. This classification of sessions seems to be a very satisfactory settlement of a frequently occurring problem.

The Secretary reported that on October 1, 1948 the membership roll contained 139,779 names and the Fellowship roster was increased to 78,331. Increase in membership over the nine month period was 4,258 and that in Fellowship 2,053.

Protest that some hospitals are practicing medicine was answered by the committee as follows: "The analysis of the laws of the various states concerning what constitutes the practice of medicine has not yet been completed by the Bureau of Legal Medicine and Legislation of the Association. Until these laws are collected, studied and appraised by both the Bureau and the Committee on Hospitals and the Practice of Medicine, it seems absurd to attempt to make a report on the subject assigned to this Committee. However, certain observations are definitely in order. This report will be, or could be, used as a background for our thinking until the above-mentioned information is available, and for action after there has been an opportunity to study the legal wording of the various state laws. It is assumed at the beginning that all of the laws will differ somewhat and that many things will be *legal*, not necessarily ethical, in one state and illegal in another. The interpretation of the vari-

ous state laws will have to be studied in the light of judicial actions, if any, that have been made in the application of the laws to specific cases . . . Until the laws of all the states are available for study and until recommendations can be made that will hold water, both ethically and legally, it behooves us to attempt to settle at the local level all matters of controversy between medical men and the various institutions where they work and practice. This can be done if personalities can be forgotten and physicians are men of good will and will sit down around a table and find out, first, on what points agreements can be reached; second, what points exist where differences of opinion are slightly divergent; third, what points are of maximum disagreement, and finally, if it can be resolved to compromise everything but broad general principles concerning that which is for the public good. It will be for the good of every physician."

The Council on Industrial Health reaffirmed its previously expressed approval of joint planning for industrial health by management, labor and medicine.

Financial support from the Government for teaching in medical schools should be accepted only after all other sources are exhausted and only as a last resort, it was agreed.

Action at the last session in regard to pay for selective service examinations was rescinded.

A recommendation was adopted to revalue the education of medical students to stress general practice rather than the specialties and to advise a two-year internship in place of the present one year.

The government is asked in Selective Service to defer premedical and medical students until the completion of their studies, including not more than two years of internship.

The Council recommended to the Board of Trustees that they press legislation which will make the Surgeon Generals of the Army, Navy and Air Corps the advisor of all medical set-up instead of the laymen in charge of logistics; in addition, that the

chief medical officers in all branches of the Armed Services have complete control of all regulations in regard to health, hospitalization, evacuation and sanitation.

Objections were raised to the usage of Veterans Administration Hospitals except for service-connected disabilities and under indigent circumstances.

Objections were raised to the erection of so many Veterans Administration Hospitals. It was felt that hospitals should not be erected in localities where hospital facilities are already sufficient.

It was reported that compulsory attendance at staff meetings was never a requirement for AMA approval of hospitals.

In a resolution adopted unanimously, it was urged that state medical societies consider the introduction of legislation making rebates illegal in states where these are not already illegal. It was also urged that state societies receive complaints concerning rebates and hold hearings and make investigations at their own expense to eliminate the practice.

It was decided to increase the activities of the Washington office of the AMA and to employ additional personnel to carry out its increased work.

The Board of Trustees was authorized to assess the members of the AMA \$25.00 this year in order to meet the added expenses to carry on activities during the coming year.

The proposal to form a national insurance company by the Blue Shield and Blue Cross for voluntary, prepaid medical and hospital care was not approved. As a substitute the House approved formation of a "national enrollment agency." This would coordinate all existing, approved medical and hospital care plans. It would also help to sell and distribute these services. Further development of coordination of reciprocity among the local plans were urged. It was also urged that in localities where plans are not in effect every effort be made to organize such plans at the earliest possible time.

The afternoon session adjourned at 5:55 p. m.

The meetings for the general practition-

ers were held at the same time and were very well attended. With two days yet to run the attendance at the close of Wednesday evening was 4,089. It was felt that by the close of the meeting the total attendance would reach the 5,000 mark.

In addition to the President, Dr. Hargrove, the Secretary, Dr. Talbot, and the Editor of the Journal, Dr. Jones, many other doctors from Louisiana were present at the meeting.

Dr. O. B. Owens and Mr. Frank Lais, of the Louisiana Physicians Service, and Drs. Guy Jones and J. P. Sanders, of the Committee on Rural Medical Service and the Academy of General Practice, attended a caucus of the Louisiana delegation during one of the luncheon intermissions.

Respectfully submitted,

Val H. Fuchs, M. D., Delegate
J. Q. Graves, M. D., Delegate.

Between the dates of November 27 and December 3, 1948, there was held in St. Louis one of the most important series of meetings ever sponsored by the AMA. On Saturday, which was known as Public Relations (PR) Day, there was presented a program of particular interest. This dealt with questions involving participation of lay groups and civilian workers in the ever-expanding field of public relations. So many of the large national lay organizations are far ahead in this field. The extent to which we are turning to such groups for inspiration and guidance was particularly noticeable. From the program one would deduce that our chief activity, from here on, should be to concentrate our efforts on the consumers of medical care (the public) and make them aware of the grave situation they would face if and when federalization of medicine became a reality. On the whole, the medical profession has been fairly well propagandized on these dangers through various mediums. We must get public opinion in our favor—this was the theme of all discussions, as I analyzed them. We need more talks to lay groups. Collateral agencies, in particular, must have a closer relationship with the

public and help to mold public opinion.

On Sunday, November 28 and Monday, November 29, I had the pleasure of attending the sessions of the Annual Conference of State Secretaries and Editors. The highlight of this program was the Symposium on Medical Legislation (National). Never has there been such frank and down-to-earth talks on the seriousness of the national situation, especially accentuated by the November 2 election. Dr. Edward J. McCormick of Toledo, Ohio, speaking as a member of the Board of Trustees of the AMA, presented a picture of the deplorable situation. His theme, forcibly delivered, was constructive criticism of the AMA for its complacency in this grave emergency. He emphasized that there is an emergency and that the time is rather short to do anything about it—but the situation is not hopeless. He read a letter, full of sarcasm, from a doctor in California, in which was put forth his own plan for the defeat of federalized medicine. This is as follows:

- "1. Continue to sit on your fat derriere and do nothing.
- "2. Be apathetic and, like 5,000,000 registered Republican voters who failed to vote, do not bother to make your opinion known. If you think, as they did, that your opinion or your vote is not worth anything, the opposition will agree with you and act accordingly, as they have.
- "3 Write an occasional letter to your congressman, tell him off, and then explain proudly to the interns in the surgical dressing rooms how smart you are and what a stinker your congressman is.
- "4. Tell everybody you see that the gag is up, and we might as well prepare for the inevitable.
- "5. Moan and groan and issue explosive and unprintable epithets.
- "6. Refer to your medical leadership as a group of impotent, ineffective and bumbling ignoramuses.
- "7. Make speeches before sympathetic lay audiences, and convert those who already believe in free enterprise.

"8. Don't bother to tell your county society heads, your state society heads, or your national association heads what you want them to do. Expect them to find a way for you without your guidance.

"9. Scream about high medical society dues and forget that our friends in the trade unions demand many times what we pay; in other words, make the situation as difficult as possible, then grumble about it.

"10. Oppose any program developed by the majority of your colleagues because it demonstrates your superior wit and your general greatness.

"11. Remain superbly and learnedly dignified when Joe Doakes asks why you oppose state medicine. Brush him aside with any insult you can think of. Joe will like you for that.

"12. Don't bother to use the selling methods which actually bring messages before the public. Continue to depend on occasional radio feature programs. Billboard advertising, newspaper advertising, radio advertising and, above all, continuous and daily radio spot programs over the national hook-ups and all such like are too commercial, too troublesome, too expensive and too undignified; don't use them.

"13. Above all, disregard the 'little guy'—the one with a vote. Tell him nothing; push him around. He doesn't know anything anyway."

Dr. McCormick pleaded for the expansion of the Council on Medical Service in Washington by the AMA which, he feels, has heretofore only been an information bureau. He stressed that the AMA should not permit subsidiary or allied medical groups to express, publicly or otherwise, opinions on medical legislation without clearing them through the parent organization. He particularly censured the Academy of Pediatrics for putting forth in Washington opinions contrary to those of organized medicine and for its support of the contention that children are not getting adequate medical care because there are not suffi-

cient pediatricians when, as a matter of fact, 80 per cent of all children's diseases are treated by the general practitioner. Such a statement is fantastic.

Dr. McCormick answered the question, "What shall we do now to meet the emergency?" as follows:

1. Imminent and close cooperation between the AMA and state societies. This would provide uniformity of action. The AMA should inform the profession regarding its stand on any medical legislation which may be controversial.

2. Data should be sent from each state to the AMA concerning the present position of Congressmen on pending medical legislation.

3. The state medical society officers should be in constant touch with their Congressmen in Washington.

4. The Washington office of the Council on Medical Service of the AMA should inform the state societies of activities of their Congressmen which are contrary to the position taken by organized medicine.

5. Bulletins put out by the AMA should contain information concerning its position on current medical bills.

6. Conflicting opinions by state societies should be avoided.

7. The AMA should advise the public of its position on medical legislation of a controversial nature.

8. The AMA should be close advisor to its state societies.

9. The AMA should introduce legislation to counteract objectionable features in medical bills.

10. Only competent and well-informed physicians should testify before committees in regard to the position of the AMA.

11. The county medical societies should be bolder in their approach to controversial medical legislation and should keep in close touch with their representatives and senators.

12. At all times a constructive program should be developed both for the physicians and public.

13. With regard to speakers, it is recommended that public debates on controversial

medical legislation should be avoided; especially appearances at forums over the radio. At times these cannot be avoided and in all instances such participants should be well informed on the subject matter presented.

14. Contact labor and other groups who may be opposed to our concepts and try to convert them to our position.

15. No county, state or collateral groups of the medical profession should state the position of organized medicine without conferring with the AMA.

16. Every doctor in the United States should be educated on the subject of federalized medicine and the job of opposing this legislation should not be left to the Board of Trustees of the AMA alone.

17. Editors of journals and other medical periodicals should not deprecate the AMA for reasons that they cannot justify. The place to settle our differences should be in the House of Delegates, committees, and conferences. Division and disunity weaken our structure.

Dr. Dwight H. Murray of Napa, California, discussing national medical legislation from the point of view of the state societies, brought out some very interesting facts. For example, in 16 states medical legislation has been introduced for the purpose of socializing medicine. None of the bills has been passed. He stated that the members of the medical profession should get into state politics as individuals but that the state societies should always remain neutral. He also stated that of the 140,000 doctors in the United States only 2,000 are working and carrying the load for the profession. Physicians also should be willing to make talks and such organizations as the Women's Auxiliary should be brought into the picture. And don't forget the legislator's wife. We now need members of the societies, willing to tackle this serious legislative program. The legislator's private physician, Doctor "X", might be the right man. After all, the fight will not be a very easy one. We must confer with allied groups and make friends with new forces, especially the insurance and banking people—they should be most cooperative.

All forms of publicity should be helpful and we must seek the aid of druggists, dentists, nurses, hospital administrators, etc. Get good team work. Do not only write letters after the damage has been done. Dr. Murray especially emphasized that all of this activity costs money and this certainly is no time to quibble about financial matters. Our opponents with their experts and billions of dollars behind them are most active. The fight does not seem hopeless. We must send aid. Now is the time.

Representative Forest Harness from Indiana gave a very interesting talk on the serious situation that now exists in Washington and the firm ground on which the proponents of federalized medicine seem to be standing. Some of his thoughts were as follows: The present government is imbued with bureaucratic philosophies which they have nurtured for several years and which they are now planning to crystalize since their victory on November 2. The time has come for the medical profession to step out on the street corners, roll up their shirt sleeves and talk to the man on the street who does the voting. We should get away from academic trends and face things on a more practical basis. Now is the time to put this philosophy into action. Representative Harness recommends that we find a way to improve our public relations and that we make medical and hospital services available to all groups. The profession should assist in promoting ways and means for increasing the number of physicians, nurses and hospitals. Behind this is the serious implication against the medical profession that it is inactive and complacent. It is high time that something new be tried and developed in practical application. Mr. Harness stated there is nothing in the present picture to invite optimism. However, the program to fight federalization of medicine should be continued if we do not wish to lose individual liberties.

It was also my privilege to sit in on other programs. I was particularly interested in the Conference on Medical Society Radio Programs. At this conference was discussed present and future status of pro-

grams which have been on the air, sponsored by the AMA and some of the state societies. From all appearances, this seems to be a most effective means of conveying to the public the stand of physicians on various questions of community interest and, at the same time, acquainting them with the position of organized medicine in relation to federal legislation. It is felt that it will be some time before we can make use of television for this purpose because it is hard to get good script writers and artists for the presentation.

On Monday morning we had the distinct pleasure of listening to Dr. Paul R. Hawley who is the Chief Executive Officer for the Blue Shield-Blue Cross Commission. He reiterated with great emphasis his opinion that it will be necessary to combine the Blue Cross and Blue Shield plans in order to meet national demands of industrial concerns employing people in various states. He was very adamant in his position that unless this combination is carried out the federal government or some other agency will step in and undertake to satisfy the public.

In the above presentation of facts and opinions I have tried to present to you some of the constructive points and decisions reached at this all-important meeting. In doing this I feel that you should be properly informed concerning national trends in order that our State Society might mold and prepare our activities in line with the policies adopted by the AMA. I hope you will realize that we have a great responsibility in this regard and that we are facing it with sincerity and faith in our cause. There will unquestionably be presented to you a more detailed report by the House of Delegates of the AMA in respect to action taken on some of the important subjects spoken of above.

It was also my privilege to attend a meeting of the National Conference of County Medical Society officers where a most wonderful program was presented. Highlights of the program were presentations by Rear Admiral Joel T. Boone of the Navy, Brig. Gen. George E. Armstrong of the Army, a

representative from the Public Health Service, a representative of the Atomic Energy Commission and last, but not least, Dr. Maurice H. Friedman. The first four gentlemen spoke principally on the needs of the medical profession in the event of a national emergency in the near future. Also, they offered proposals for developing plans in municipal and damaged zones to meet situations which might develop as a result of atomic bombing. The last speaker, Dr. Friedman, presented a break-down of statistics accumulated by the government, incident to the rejection of draftees for physical defects during the last war. You know that these statistics prepared by the government have been erroneously used to make the public believe that if more medical care had been available such a large proportion of draftees would not have been rejected. An interesting feature of these government figures is that they do not include

the volunteers but only those who were drafted, which made the percentage of rejections much higher. I am sure that you all have read in Louisiana papers, as well as medical journals, the testimony of Dr. Friedman last year before the Senate Committee on Labor and Welfare at which time he showed, without fear of contradiction, that the statistics presented by the government in this regard were absolutely fallacious in the majority.

I believe that you will agree with me that we are today facing one of the greatest tests to confront the medical profession. It is hoped that I have indicated some avenue of approach to the problems facing us in my attempt to bring to you a report of the recent meeting of the AMA.

Respectfully submitted,

P. T. Talbot, M. D.,
Secretary-Treasurer.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

TRIBUTE TO DR. MORGAN SMITH

Members of the Seventh District Medical Society:

Be it resolved that we here pay tribute to our professional friend and colleague, Dr. Morgan Smith, for his inestimable services and for his gracious consideration for his fellow workers; for the aid which he so willingly rendered in uplifting the mental, physical and social life of our community and for his valuable contributions to the field of medicine.

It was the happy lot of our late associate, Dr. Smith, to make for himself a fortunate life and to be given the satisfaction of knowing that the ample fruits of his labors were to remain for the enrichment of this community.

Be it further resolved that in recognition of the

long and untiring services of Dr. Smith, we place a copy of this tribute in the minutes of the Seventh District Medical Society and that a copy be sent to the New Orleans Medical and Surgical Journal and another copy sent to Mrs. Hattie Smith in deep appreciation of true worth.

EAST AND WEST FELICIANA BI-PARISH SOCIETY

The Bi-Parish Medical Society of East and West Feliciana Parish met in the Educational Room of the Clinton Baptist Church.

After an excellent dinner prepared by Mrs. Willie B. Hubbs and aids, the Society met for a business meeting and scientific program.

Officers elected for 1949 are as follows: Dr. L.

S. Nolan, Jackson, Louisiana, President, Dr. Paul Jackson, Clinton, Louisiana, Vice President, Dr. E. M. Toler, Clinton, Louisiana, Secretary-Treasurer. Delegate to the Louisiana State Medical Society meeting, Dr. Glenn J. Smith, Jackson, Louisiana, Alternate, Dr. Paul Jackson, Clinton, Louisiana.

Scientific program was as follows: Dr. Cecil Lorio of Baton Rouge, Louisiana, gave an interesting and instructive lecture on Celiac Syndrome. Dr. Lorio's lecture was favorably received by all members present.

Dr. W. E. Barker, of Plaquemine, Louisiana, gave an interesting discussion on medical economics or "Medicine at the Cross Roads." Dr. Barker's talk stressed the danger of bills that may be presented in the 81st Congress of the United States dealing with state medicine.

A resolution by the Society was passed unanimously concurring in the viewpoint of Dr. Barker. It also requested the Bi-Parish Secretary to present a protest signed by all the members of the Society asking the Louisiana Senators and Congressmen to vote against any bill or bills detrimental to the members of the medical and surgical professions of our state. We have the best system of medicine and surgery in the world; therefore, we most vehemently protest and object to any change or meddling by Congress in the medical profession of the United States of America.

Dr. J. C. Rudd of Baton Rouge, Louisiana, Dr. Hodges of Jackson, Louisiana, and Dr. R. J. Field of Centreville, Mississippi were visiting guests.

The Society adjourned to meet in the East Louisiana State Hospital, Jackson, Louisiana, the first Wednesday in March, 1949, at 7:30 p. m.

L. S. U. MEDICAL ALUMNI ASSOCIATION

The New Orleans District of the L. S. U. Medical Alumni Association will hold its election meeting February 2 in the Stein Room, Jackson Brewing Company.

At this meeting nomination of officers for the state Alumni Association will be made.

The New Orleans District will be host at a cocktail party to be given May 6 for L. S. U. medical alumni attending the Louisiana State Medical Society meeting.

FIFTH DISTRICT MEDICAL SOCIETY

The annual meeting of the Fifth District Medical Society was held in Monroe, La., at the Virginia Hotel, Dr. H. S. Coon, President, presiding. An excellent and highly interesting program was enjoyed by the 45 members in attendance. Dr. Francis E. LeJeune discussed carcinoma of the larynx and showed slides and a most unusual motion picture on the subject. Dr. Roswell D. Johnson spoke on newer advances in the treatment of diseases of the blood-forming organs in children, bringing to light many phases of this highly com-

plex subject.

At the dinner the following officers were elected: President, Dr. Carl L. Langford, Ruston; Secretary-Treasurer, Dr. F. E. McCarty, Monroe; Alternate to the Councilor, Dr. Tom Dekle, Jonesboro.

Dr. W. L. Bendel reported on the present status of the Louisiana Physicians Service.

The meeting was honored by the presence of the President of the State Society, Dr. M. D. Hargrove, who presented the latest information concerning the plight of the medical profession as regards socialized medicine. He exhorted each member to extend every effort to defeat this threat through personal contact with patients, meetings in public and donation of funds.

It was regretfully reported that the following members had died recently: Dr. C. P. Gray, Sr. and Dr. H. V. Collins, both of Monroe; Dr. V. E. Dudley of Lillie, La.; and Dr. R. Harlow of Jonesboro, La.

The meeting was then adjourned. Dr. Fred A. Marx expressed his thanks to the membership for their cooperation during his term as secretary.

"DETAIL MAN"

Personally, we like most "detail men." In case you haven't had contact with one recently, may we refresh your mind on the subject? Were we *Linnaeus*, we might describe him thus: Genus: *Homo Sapiens*; Habitat: Distribution almost universal, but becoming scarcer in Middle West due to the draft and lack of enforcement of game laws. (Most Dox think there is a perpetual open-season on these chaps.) Description: A hardy perennial. (Webster's definition of perennial: "continuing or enduring through the year or many years.") And, Boy, does he continue to endure a lot!

Further Description: This sub-order of *Homo Sapiens* not infrequently is married, and sires one or more little detailettes who depend upon the parent shrub for food and raiment. He has the customary complement of manual and pedal appendages; also, two ears, two eyes, two lungs and—believe it or not—a heart.

Usually he is a gentleman, which in itself is saying a lot. Obviously this rare specimen has an inexhaustible fund of patience, otherwise he would not be willing to cool his heels in your reception room for long periods of time, awaiting your willingness and readiness to see him for five minutes. He knows, of course, that in order to impress him with your importance, he will have to sit on his quadriceps in the outer sanctum until you get darn good and ready to admit him to your august presence.

He is a non-poisonous plant. Contact with him engenders no long and lingering ailment. He may be touched with impunity. (In fact, we have known instances where he was "touched" for sev-

eral dollars worth of valuable samples, simply for the asking.) He is odorless and tasteless, but is not, as we have implied, without feeling. He may be, at his worst, the rambler type of plant, in that he rambles on past the few minutes allotted to him, but still he cannot be classed with *Rhus Toxicodendron* or the Spiny Cactus.

Often he is addicted to tobacco, but unless you first light a cigarette, usually he will refrain from doing so while in your presence. He knows from long and bitter experience that while *he* is non-toxic, some *Dox* can be poisonous as toad stools—especially to “detail men.”

So if you see one of these roving, self-abnegative, hard-working, patient and pleasant fellows beginning to take root in your reception room, for Heaven's sake have the girl bring him in before he becomes a permanent potted plant before your very eyes. Because all of you know how much easier it is to dispose of cut flowers than a jardiniere full of flowering hydrangeas.

But seriously, Fellows, let's give these boys a break. We are busy, of course, but not *too* busy to spare a few minutes of our time when it easily might be of mutual benefit. Ever hear of the Golden Rule? Think it over sometime; it will do you good.

—J. Phil. Edmundson, M. D.

Reprinted from the Jackson County Medical Society Weekly Bulletin

NATIONAL GASTROENTEROLOGICAL ASSOCIATION 1949 AWARD CONTEST

The National Gastroenterological Association again takes pleasure in announcing its Annual Cash Prize Award Contest for 1949. One hundred dollars and a Certificate of Merit will be given for the best unpublished contribution on Gastroenterology or allied subjects. Certificates will also be awarded those physicians whose contributions are deemed worthy.

Contestants residing in the United States must be members of the American Medical Association. Those residing in foreign countries must be members of a similar organization in their own country. The winning contribution will be selected by a board of impartial judges and the award is to be made at the Annual Convention Banquet of the National Gastroenterological Association in October of 1949.

Certificates awarded to other physicians will be mailed to them. The decision of the judges will be final. The Association reserves the exclusive right of publishing the winning contribution, and those receiving Certificates of Merit in its Official Publication, the Review of Gastroenterology.

All entries for the 1949 prize should be limited to 5,000 words, be typewritten in English, prepared in manuscript form, submitted in five copies accompanied by an entry letter, and must be received not later than April 1, 1949. Entries

should be addressed to the National Gastroenterological Association, 1819 Broadway, New York 23, N. Y.

SOUTHWEST ALLERGY FORUM

The Southwest Allergy Forum will meet in El Paso, April 4th and 5th, 1949.

NEWS ITEM

Dr. Roy Carl Young, psychiatrist and neurologist, attended the meeting of the Southern Psychiatric Association in Dallas, Texas, on December 7th and 8th.

NEW OFFICERS OF COMPONENT SOCIETIES

The following officers have been elected by their respective parish societies to serve for 1949:

Allan Parish Medical Society

President—Dr. W. R. Hargrove, Oakdale
Vice-Pres.—Dr. Gurdon Buck, Kinder
Sec.-Treas.—Dr. R. E. Pace, Elizabeth
Delegate—Dr. Gurdon Buck, Kinder

Ascension Parish Medical Society

President—Dr. Gerald Gaudin, Gonzales
Vice-Pres.—Dr. Earl Schexnayder, Donaldsonville

Sec.-Treas.—Dr. Dawson T. Martin, Donaldsonville.

Delegate—Dr. P. H. LeBlanc, Donaldsonville
Alternate—Dr. H. A. Folse, Donaldsonville

Avoyelles Parish Medical Society

President—Dr. Filmore P. Bordelon, Marksville
Vice-Pres.—Dr. H. G. Temple, Bunkie
Sec.-Treas.—Dr. S. R. Abramson, Marksville
Delegate—Dr. A. M. Abramson, Marksville

Beauregard Parish Medical Society

President—Dr. Luke M. Marcello, DeRidder
Vice-Pres.—Dr. Sam T. Roberts, Sr., DeRidder
Sec.-Treas.—Dr. Thomas R. Sartor, DeRidder
Delegate—Dr. John D. Frazar, DeRidder
Alternate—Dr. Luke M. Marcello, DeRidder

Caddo Parish Medical Society

President—Dr. J. P. Sanders, Shreveport
1st Vice-Pres.—Dr. Keith Mason, Shreveport
2nd Vice-Pres.—Dr. Charles L. Black, Shreveport

Secretary—Dr. H. M. Yearwood, Shreveport
Treasurer—Dr. L. L. Davidge, Shreveport
Historian—Dr. A. A. Herold, Sr., Shreveport

Claiborne Parish Medical Society

President—Dr. J. E. Batchelor, Haynesville
Vice-Pres.—Dr. W. P. Gladney, Homer
Sec.-Treas.—Dr. M. L. Forcht, Jr., Haynesville
Delegate—Dr. Thomas M. Deas, Homer
Alternate—Dr. M. L. Forcht, Jr., Haynesville

DeSoto Parish Medical Society

President—Dr. G. Cooper, Mansfield
Vice-Pres.—Dr. H. P. Curtis, Mansfield
Sec.-Treas.—Dr. R. A. Tharp, Mansfield
Delegate—Dr. R. A. Tharp, Mansfield

- Alternate—Dr. R. P. Thaxton, Mansfield
Jefferson Davis Parish Medical Society
 President—Dr. G. McClure, Welsh
 Vice-Pres.—Dr. G. G. Richard, Lake Arthur
 Sec.-Treas.—Dr. L. E. Shirley, Jennings
 Delegate—Dr. John G. McClure, Welsh
Rapides Parish Medical Society
 President—Dr. Richard E. C. Miller, Alexandria
 1st Vice-Pres.—Dr. Edward Claude Uhrich, Alexandria
 2nd Vice-Pres.—Dr. Morris J. Hair, Lecompte
 Sec.-Treas.—Dr. Harry Gahagan, Alexandria
 Delegate—Dr. H. H. Hardy, Alexandria
 Alternate—Dr. B. M. Wilson, Alexandria
Sabine Parish Medical Society
 President—Dr. L. H. Murdock, Zwolle
 Vice-Pres.—Dr. G. F. Weber, Many
 Sec.-Treas.—Dr. A. A. Flores, Pleasant Hill
St. Tammany Parish Medical Society
 President—Dr. Foote R. Singleton, Slidell
 Vice-Pres.—Dr. Jos. F. Polk, Slidell
 Sec.-Treas.—Dr. Durwood J. Thobodaux, Slidell
 Delegate—Dr. Roy C. Young, Covington
 Alternate—Dr. T. J. Healy, Covington
Webster Parish Medical Society
 President—Dr. Joseph M. Garrett, Cotton Valley
 Vice-Pres.—Dr. C. S. Sentell, Minden
 Sec.-Treas.—Dr. C. M. Baker, Minden
 Delegate—Dr. C. S. Sentell, Minden
 Alternate—Dr. C. M. Baker, Minden

HERMAN VASCOE COLLINS

1882-1948

Dr. Herman Vascoe Collins, member of the Ouachita Parish Medical Society, died in Monroe on December 2, 1948. Dr. Collins was a graduate of the Atlanta School of Medicine in 1912. He was an active and interested member of the State Society since 1925 and was in practice in Monroe from 1938.

JOHN T. CREBBIN

1873-1948

Dr. John T. Crebbin of New Orleans died on October 20, 1948. He was a former member of the Caddo Parish Medical Society and later of the Orleans Parish Society. He was a graduate of the 1900 Class of the Hahnemann Medical College, Chicago, Ill.

LEO NEHEMIAH ELSON

1884-1948

Dr. Leo Nehemiah Elson of New Orleans died on December 12, 1948. He was a member of the Orleans Parsih Medical Society. Dr. Elson was a graduate of Tulane Medical School, Class of 1914.

COURTLAND PRENTICE GRAY

1882-1948

The Ouachita Parish Medical Society has reported the death of Dr. Courtland Prentice Gray of Monroe, La., in December, 1948. Dr. Gray was a member of the State Society since 1914, served as President 1935-1936 and actively participated in its activities. He graduated from the Baltimore Medical College in 1904.

EDMOND KLAMKE

1875-1948

Dr. Edmond Klamke of Alexandria, La., died on October 13, 1948. He was associated with the Rapides Parish Health Unit and was an active member of the Rapides Parish Medical Society, serving as second vice-president in 1945. Dr. Klamke was a graduate of the University of Copenhagen in 1901.

LEWIS HENRY PIRKLE

1873-1948

Dr. Lewis Henry Pirkle of Shreveport, La., died on November 5, 1948. Dr. Pirkle was a member of the Caddo Parish Medical Society since 1914. He was a graduate of Tulane Medical School in 1904.

BOOK REVIEWS

A History of the Heart and the Circulation: By Frederick A. Willius, M. D., M. S. in Med., and Thomas J. Dry, M. A., M. D., Ch. B., M. S. in Med., Philadelphia and London, W. B. Saunders Company, 1948, Pp. 435. Illus. price, \$8.00.

This book is divided into three parts. The first part of two hundred sixty-five pages contains eight chapters. Each chapter is followed by a summary with adequate references. This part covers the period from antiquity to the first quarter of the twentieth century. An account is given of the work and contributions of those who have given most in building the foundation on which our present day knowledge now stands. The influence of different races is given. No less inter-

esting is the influence of certain individuals on the progress of medical knowledge. The most remarkable is that of Galen, whose influence swayed medical thought for fourteen and a half centuries.

The second part is composed of special biographies. In these ninety-five pages an account is given of the lives and works of those great personalities and observers who have contributed so much, each one from his own field of endeavor. It begins with Hippocrates (460-377 B. C.) ending with Sir Thomas Lewis (1881-1945). The story of these men, now as always, should be a source of inspiration. There are many quotations, as in the first part of the book that are worthy of consider-

ation even in our day, especially those of Sir James Mackenzie.

The third part of seventy-one pages is a chronological presentation of data according to subjects, arranged in alphabetical order. The first subject mentioned in this part of the book is anatomy of the heart and circulation. The first name mentioned under this subject is Imhotep, a somewhat mythical individual who was supposed to have lived about 3,000 B.C. In these pages one can quickly find the names of those who have made the most important contributions, when they lived, and what they did, by looking under the subject one is interested in at that moment—let it be anatomy, aneurysm, electrocardiography, or therapy.

The print and reproductions are good and the book is easy to read. Anyone interested in cardiovascular disease or any part of medicine will find it a quick source of information. The authors have rendered a valuable service.

J. M. BAMBER, M. D.

Venous Thrombosis and Pulmonary Embolism: By Harold Neuhoof, M. D., New York, Grune & Stratton, 1948. Pp. 159. Price, \$4.50.

This monograph is a report on extensive studies made by the author, acting on an assignment by the Medical Board of the Mount Sinai Hospital to study the role of pulmonary embolism as a cause of death and to work out a plan for its surgical management.

The frequent insidious development of venous thrombosis in the lower extremities and the difficulty of early recognition of its occurrence is stressed both in general statements and in the numerous illustrative case reports.

Surgical treatment of various thrombosis, as well as an evaluation of the present status of anticoagulant therapy, is presented in a critical manner.

The author fully discusses peripheral pulmonary embolism and also gives a detailed report on massive pulmonary embolism based in part on a study of 88 fatal cases.

Methods of treatment of massive pulmonary embolism are reviewed and the several reasons for an unfavorable attitude toward pulmonary embolectomy are cited. Although autopsy revealed that from topographical features alone, embolectomy would have been feasible in 33 of the 88 cases, there were amongst these 33 cases no distinctive clinical features to differentiate them from less favorable cases, thus leading to the inevitable conclusion that an operation always must be regarded as an exploratory one. Of the 88 cases almost half were suffering from otherwise irremediable conditions. There were between 15 and 26 cases over a ten year period in which favorable criteria for embolectomy existed.

The occurrence of death after the onset of symptoms was within ten minutes in 18 cases; in eleven

to fifteen minutes in 9 cases; in sixteen to thirty minutes in 11 cases; and in one half to one hour in 8 cases. Twelve died in one to four hours; 6 in four to ten hours; 5 in ten to twenty-four hours. From these observations the author concludes that a significant fact concerning the cases to be regarded as favorable for embolectomy is that the duration of life was short in many. As stated by the author, this is quite out of line with the protracted duration of life for which the Trendelenburg operation has been advocated.

Altogether, this volume is a most worthwhile publication, bringing together in monograph form a great fund of data as well as the author's personal thoughts concerning venous thrombosis and pulmonary embolism.

AMBROSE H. STORCK, M. D.

Pre-Operative and Post-Operative Care of Surgical Patients: By Hugh C. Ilgenfritz, St. Louis, C. V. Mosby Co. 1948. Pp. 898. Illus. Price, \$10.00.

This well written book covers the difficult subject of preoperative and postoperative care of surgical patients in an admirable manner.

Starting with a discussion of fluid and electrolyte balance the author continues with a discussion of metabolism and nutrition, sedatives, general preoperative measures, shock, transfusions, organic diseases, chemotherapy, postoperative complications, and the preoperative and postoperative care of patients with disease of various organs. There is also a good resumé of preoperative and postoperative treatment of wounds and burns.

A valuable feature of the book is the presentation of the physiologic basis for the therapeutic measures advocated.

The book reflects the author's extensive knowledge of the current literature and contains numerous references.

This volume should be of special value to surgical residents and interns.

WENDELL H. KISNER, M. D.

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A PLEA FOR CLINICAL DIAGNOSIS IN PRESENT DAY MEDICINE*

URBAN MAES, M. D.

NEW ORLEANS

During my years as a teacher, it was one of my assignments to conduct a "Dry Clinic." The plan was to review the student's history and examination of a patient, to arrive at a probable diagnosis, and then to suggest measures for the cure or relief of the patient. Some of the old surgical texts referred to this study as "Surgical Diagnosis and Surgical Therapeutics."

I have seen patients whose diagnoses may be listed, for illustration purposes, as: gall bladder disease, certain stomach disorders, thyroid disease, or complications of diabetes. These patients would have first been on medical wards for a time, and would then have been transferred to surgical wards. The medical instructor, in too many cases, had not been familiar with surgical therapeutics. While there could not have always been a promise of complete cure, there would have been either a possibility of prolongation of life or relief of distressing symptoms. Closer correlation of the medical and surgical services would certainly have meant earlier relief. I am sure that if students were taught to evaluate patients as clinical entities, instead of as objects for laboratory study, quicker diagnosis and quicker relief would result.

The use of surgical therapeutics, as a means of helping the sick person, has not

reached perfection by any means; it may be the best we have to offer at this time, and there should always be the urge to improve. To quote the late W. J. Mayo, "Tomorrow is the great day in medicine."

My thesis is: Let's make a more intimate study of the sick man or woman with God given faculties, possessed by all of us. I do not mean, in any sense, to belittle or underestimate the value of laboratory studies, but they should be used more as a "clinical science" to supplement and implement our "clinical sense."

When a student or an intern begins his story of a patient's illness with blood counts, hematocrit readings, urea clearance readings, etc., I know that he has not looked at the patient as a sick individual but as an object for study. One always feels that the sick man should be boiled in a test tube to see what reactions one can get, or that he should be sliced under a microtome to determine his histopathology. Would it not be better to call such men biologists and not physicians? The term physician not only implies that we should try to find out what is wrong with a patient, but to use the best means we have to cure him or, at least, to improve his condition. Even the hopelessly ill man can be given a measure of relief.

I can recall an incident that occurred some years ago when a patient of mine was not satisfied with my opinion; he insisted on consulting a distinguished internist in one of the Eastern centers. It took several days to complete various examinations that were made in many different laboratories. When the patient returned to me he brought with him many reports carefully typed and

*Read before the Surgical Association of Louisiana, November 11, 1948.

bound. There were twelve typed pages of data without a single conclusion. The man turned out to have had a solitary abscess of the liver—this had been suspected, and was confirmed by the exploring syringe. Proper treatment was instituted with complete recovery.

It is not my intention to condemn proper use of the laboratory in the study of disease or for arriving at proper conclusions as to what is wrong with a patient or what his treatment should be. My contention is with the approach to the study of the disease. I have suggested, on occasions, that a special period should be assigned to teach students the method of starting to get a history. How often do we hear a sick man asked, "What is the matter with you?" All too often he has read something in the lay press, or even in some medical journal; perhaps he has had an opinion, after a superficial examination, of another doctor. The patient will have some vague notion of what his trouble is, and he does not hesitate to give it to you. With the careless physician (and I am positive there are some) the patient may well be treated for what he himself says he has. I have seen such a person operated on for hemorrhoids when the patient had a carcinoma of the rectum. Here is where we may have our suspicions confirmed by the x-ray laboratory. I have frequently used the aphorism that "a finger in the rectum will give more information than a thermometer in the mouth." How often have we seen iodine in some form given in nontoxic thyroid disease? In the manner of approach to the sick individual, it might be well to imitate the great philosopher, Sir Berkley Moynihan. His paper on "Inaugural Symptoms" might well be read with profit to all of us. His very practical system was simply to let the patient tell the whole story about himself. That, plus the answers to a series of well directed questions by the examining physician, put him on the right track. I have often pondered over the right first question. After trying many different ones, I have finally concluded that for routine use I can ask simply, "How long have

you been sick?" This will almost always open up a series of observations that will help in making a decision.

Having spent most of my medical life in clinical medicine, I may be somewhat prejudiced in my ideas about the training of present day medical students. It is my firm conviction that the future of medicine lies in the more scientific side. Undoubtedly, the physiologist, the biochemist, and the biologists will be responsible for the advances that are to be made. My plea is not, in any way, to have fewer of these sciences; my hope is to have them more useful in their application.

There are many diseases in which the laboratory—and the laboratory alone—can give us the information that is necessary for the final label to be placed on a patient's disease. It is certain that an estimate of what the patient can stand and what the outlook is, in many instances, can only be furnished by laboratory study. My plea is that we have a sick man to deal with, and he should have the benefit of thorough clinical study as well as the wise application of necessary laboratory data.

As a practicing surgeon, I might ask, "Who among us would care to undertake a serious operation without an accurate knowledge of the patient's organs?" It is such studies that have increased the application of surgical therapeutics in a more sane and safe way. Blood studies, kidney function, liver studies, all give information that have direct bearing on the prognosis. The x-ray has made the recognition of gastrointestinal malignancy operable in many instances, in which a marked prolongation of life or a complete cure may be expected. I have one patient today alive, twenty years after a gastrectomy for malignant disease, and this same patient is alive and well three years after a resection of her colon for a different type of carcinoma. All of this was made possible by early studies with x-rays. This patient's postoperative care was guided by laboratory studies of organic function.

In a classical address by Prof. John A.

Ryle, delivered at the Annual Meeting of the Medical Society of London (published in the *Lancet*, May 12, 1939) he illustrates the acumen of Sir William Gull. The surgical staff were concerned over the failure of a fracture to unite. During the discussion, Gull was passing through the hall, and his opinion was casually requested. Gull's only comment was, "Feed him tomatoes." His keen eye had noticed that the patient had the stigmata of scurvy. His advice was followed, and the fracture promptly united.

The late great Harvey Cushing once told me of an episode in a Boston hospital. The Chief of Medicine was on vacation, and some of the staff were in charge of the service; they were conferring about a patient with a continued fever. Numerous studies had been made, such as blood counts, blood chemistries, blood cultures. Many x-ray pictures had been taken; several electrocardiograms had been made and checked, but no conclusions had been reached. A general practitioner, from a small neighboring community, happened in as a visitor, and was invited to make rounds with the staff. After listening to the history on the patient, with whom the entire staff was by now concerned, after hearing reports of the numerous laboratory studies, this country doctor looked at the patient's tongue, palpated an enlarged spleen, noticed some rose colored spots on the man's abdomen, and then casually turned to the staff and remarked, "I did not know there was any typhoid fever in this part of the country." I leave the consternation of the staff to your imagination. While certain laboratory data, correctly interpreted, would have helped, the clinical findings in this case were quite enough for a diagnosis. To those of us who are frequently reminded of the high cost of medical care we might well ponder this example.

I frequently wonder if it might not be good training to imitate the clinics of Joseph Bell of Edinburgh. You may recall that he was the inspiration for the great detective, Sherlock Holmes. Conan Doyle was one of Bell's students, and from his astute deductions, Doyle created that first

and greatest character of detective fiction. Bell would have a patient walk through the room, or would have one observed for a brief period. He would then ask his students what they had discovered. A classmate of Conan Doyle's once told me that what Joseph Bell found out from those quick observations was uncanny. By a man's walk, one might conclude whether he had been a sailor, a soldier, or a civilian. By his color, or his expression, one can often (by the use of such simple facts) suspect what further investigations must be made. The cachectic patient, the emaciated individual, the arthritic, the anemic may all be recognized without much effort. One of my staff once made—and later confirmed—the diagnosis of Paget's disease by the simple statement from a patient that each time he bought a hat he had to get a larger size.

All of this is not meant to convey the idea that such a superficial examination should, under any consideration, be final. I mean to suggest that accurate observations with our own special senses, which God gave us to use, are not to be discarded.

The pure scientist may often say that clinical diagnosis is "guess work." Would that same scientist say that a sense of smell, a sense of hearing was "guess work"? John Ryle says, "Let us freely admit that some physicians, with a high endowment of clinical sense, are not wholly aware of the stages or processes of their judgment, or that they have lacked time or desire to investigate them. The fact remains that these judgments are the result of sensory habit and discipline."

Could it be the fault of those of us who have been teachers, those of us who are still teachers, that we are not giving the young physician a chance to recognize his "clinical sense"? Perhaps the fault lies in the college, or even in secondary education, where his school curriculum is "cut and dried;" there seems to be no place in it for exploration of his own. Perhaps our task should begin with the medical school curriculum where we would give the student an opportunity to develop an awareness of this clin-

ical sense. As he became an interne his curiosity would then be more easily aroused, and he would have learned the advantage of wanting to know. I do not, in any manner, want to suggest that intuitive diagnosis should be encouraged. As DaCosta has so aptly said, "Quick diagnoses are a frequent, and rapid method of arriving at a wrong conclusion."

Decisions often come as a result of long experience. Frequently conclusions cannot be explained, are not intentional, but simply the exercise of one's ability to observe, to remember, and to compare. How often do we hear, "This patient reminds me of one I saw once that turned out to have had such or such a condition"? This experience is the outgrowth of a retentive memory and a thorough knowledge of the pathologic possibilities. Sometimes I find it embarrassing to explain or make rules which would serve as a guide in arriving at a diagnosis. When seeing the person as a whole human being (not in a test tube) we frequently form certain conclusions which are difficult to explain. I repeat, a few well directed questions will often put us on the right track. This is the result of training and disciplining our special senses. We can recall the days when the fast disappearing, but useful, person—the family doctor—could walk into a room, and by some characteristic, but undescribable odor, and a look at a patient come to some "suspicion" of diagnosis. When pursued to the end, the right diagnosis would be gained. In some of the early monographs on yellow fever, we can recall that the odor, plus the appearance of the patient, was almost enough for a diagnosis.

In World War I, many of us became familiar with the odor of gas bacillus infections. We would walk into a ward and ask where the "gas case" was. I took pride in my ability to detect these infections until one day an incident served to "curb my bit." As a consulting surgeon near the front, I walked into a sorting station where there were some wounded Germans. I asked the sergeant in charge where his "gas case" was. He answered with a smile

that there were no "gas cases". It happened that he had just removed a German's boots. Do you wonder that my pride was wounded?

I was trained in the narrow clinical school, and I am making the plea that the approach to learning about a patient should be clinical first with confirmation later by the laboratory. Palpation, auscultation, and percussion should not be abandoned. We need not always rely on the laboratory to be the superclinician to do all our thinking for us. Confirmation by the laboratory, when indicated, is always more accurate, but we dislike to see the older tried and true concept completely discarded. Isn't it to be assumed that the patient becomes less human if he is seen only through laboratory reports. And will the physician be as much of a human to the patient?

Sir Frederick Gowland Hopkins of Cambridge, during a medical address to the Royal Society in 1934, quoted the following line: "The older physicians, with minds undisturbed by a crowd of scientific facts, developed a clinical sense—*sui generis*—as subtle as the sense of taste or the sense of smell, and it was on this sense that the great school of English medicine was founded."

I sometime wonder if the development of some narrow specialties are not responsible for the change in medical teaching? My plea is: let's still use the art of true medicine and not become robots dependent entirely upon the sciences. By adhering to certain fundamentals we can become more independent; we can possibly cut down the high cost of medical care. Judicious use of the laboratory is indispensable; its abuse is conducive to mental laziness.

Medicine and surgery cannot be practiced by rule; there is not a mathematical formula that, in our profession, can take the place of knowledge and orderly thinking combined with experience.

It is, in my opinion, a great pity that the days of the preceptor are gone. A period of apprenticeship was of inestimable value to the professions. It is not my intention that we should look backward, but we could

well remember what has been tried and proved to have been good.

In concluding, may I remind you of the words of Frank Cook, Esq., from Guy's Hospital Gazette, October 1938. "In the practice of medicine you can only do one job at a time, whether you are a quick worker or slow. If the rest of the world seems to be pestering you with all its troubles, turn to it a blind eye and a deaf ear whenever you are applying your faculties to the art of diagnosis."

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RETROPUBIC PROSTATECTOMY*

EDGAR BURNS, M. D.†

NEW ORLEANS

The first reference to extravesical suprapubic removal of the prostate was made in 1909 by Van Stockum¹ of Rotterdam. Other reports describing procedures utilizing the same general principle were made by Otto Maier² of Innsbruck in 1924, and by Jacobs and Casper³ in America in 1933. Having noticed for some time the excellent exposure of the prostate during the operation of cystoprostatectomy, Millin⁴ in 1945 carried out a series of anatomic dissections with a view to performing suprapubic extravesical prostatectomy. He quickly appreciated the ease of the approach and in August 1945 performed his first retropubic prostatectomy. I was visiting him in London on the third anniversary of the performance of this first case, by which time he had performed the operation approximately 900 times. The technic developed and refined by him is now becoming popular in many medical centers throughout the world.

It seems important to emphasize that the retropubic operation is not a universal cure for all types of prostatic obstruction. Benign prostatic hyperplasia begins as a lesion composed of small spheroids beneath

the mucosa of the prostatic urethra. As the adenoma develops, the normal prostatic tissue is compressed laterally against the fibrous anatomic capsule of the gland and forms a peripheral shell, or so called surgical capsule, from which the hypertrophied mass can be enucleated by blunt dissection. It is in this group of cases that the retropubic operation is especially well adapted.

In vesical neck obstructions which are due to fibrosis, that is, bars and contractions of the vesical neck, the prostate is not easily separated from its capsule and does not lend itself well to any type of open surgical procedure. This is also true of prostatic carcinoma which has invaded the capsule and periprostatic region. It is generally recognized that these patients should be treated by transurethral prostatic resection. Under good vision the prostatic urethra can be reconverted into a normal channel.

Prostatic carcinoma usually originates in the posterior lobe, although the lateral or median lobes may be primarily involved. It is probable, however, that 90 per cent or more of all cases of prostatic cancer originate in the part of the prostate which is not in apposition with the prostatic urethra. This accounts for the fact that the disease in its early stages produces no symptoms. A small nodule felt on rectal examination of the prostate of a man in the carcinomatous age should be suspected of being malignant, as it is only in this way that the condition will be discovered during this stage when prostatic cancer may possibly be cured by radical removal of the prostate with its capsule. Radical removal may be accomplished by either the retropubic or perineal route. A nodule felt on rectal examination is only presumptive evidence of carcinoma and should be confirmed by biopsy before radical removal is performed. Since the suspected area is in the posterior lobe, it is more accessible through a perineal approach. If biopsy proves that the nodule is inflammatory, the wound may be closed and only a simple operation has been performed. On the other hand, if radical retropubic prostatectomy is decided upon,

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one must assume that the nodule is carcinomatous since the advantage of biopsy before removal is lost by the anterior approach.

If the retropubic operation is reserved for cases of true benign hypertrophy, as we believe at this time should be done, this approach appears to have a number of advantages over other methods for the removal of this type of obstruction. The approach is direct, is anatomically sound, and does not endanger or disturb other important organs. Since all obstructing tissue is removed, the risk of recurrence is eliminated.

It is not the purpose here to review in detail the technic of the operation, but certain technical considerations should be emphasized. The operation is done in a highly vascular area and careful attention to hemostasis is required. After the retropubic space has been exposed, the area is inspected for the presence of superficial veins to the prostatic capsule; attention must be given to such veins at this time or they will be torn in a later stage of the operation and give rise to troublesome bleeding. They should be seized with hemostats and divided and each hemostat touched with the coagulating current. These veins are thin-walled and do not lend themselves well to ligation. A transverse incision is next made in the capsule and oozing which comes from the cut margins is controlled by T forceps. A small artery is not infrequently seen spurting from near the middle of the upper flap; this is clamped and coagulated. After the adenoma has been enucleated, a wedge is removed from the vesical neck so that there is no elevation of the posterior lip. This was a factor in causing postoperative urinary retention in some of Millin's early cases. With the aid of the Millin suction tip, bleeding from the prostatic fossa is easily located and controlled under vision by either ligature or light coagulation. The capsular incision is next closed with a single layer of continuous chromic catgut sutures, which completes the hemostasis. Drainage is secured by a retention urethral catheter, which requires little attention after the first twenty-four

hours. We have had no cases of postoperative or delayed hemorrhage. Of the 35 patients operated on by Millin during my visit to London, in only two cases was it necessary to irrigate the catheter during the postoperative period for removal of blood clots. Nothing else was required after the clots were removed. Convalescence following retropubic operation is more rapid and satisfactory than following any other type of operation for benign prostatic hypertrophy. We have had some of these patients leave the hospital completely healed with normal bladder function on the eighth postoperative day. The average duration of hospitalization is ten to fourteen days.

Associated lesions of the bladder do not necessarily constitute a contraindication to retropubic prostatectomy if the prostatic obstruction is the type which is amenable to this approach. Stones in the bladder may be removed through the incision in the prostatic capsule after enucleation has been completed. On the other hand, if for any reason it seems wise to open the bladder, one should not hesitate to do this. We recently encountered two cases of this type. The first case was a patient with multiple small stones in the bladder in addition to prostatic obstruction and it was felt that some fragments might be left if an attempt were made to remove them through the capsular incision. For this reason, the bladder was opened first and after the stones had been removed, the cystostomy opening was closed with a double layer of continuous catgut sutures and retropubic prostatectomy was then carried out in the usual manner. Convalescence was uneventful. The second case was a man of 78 years with cardiovascular disease, two stones in the left lower ureter partially obstructing the left kidney, two stones of unusual size in the bladder, and large benign prostatic hypertrophy. A lower midline abdominal incision was made and the stones were removed from the left ureter. The bladder was next opened for removal of the stones, which seemed too large to permit removal through the vesical neck. The

incision in the bladder was closed with a double layer of continuous catgut sutures after which retropubic prostatectomy was carried out. There was no significant change in blood pressure during the operation and convalescence was uneventful.

It would be absurd to state that any operation upon the prostate is completely free of complications. Osteitis pubis following retropubic prostatectomy has been reported. Millin has had 3 cases in his large series. Cases have been reported following transurethral resection as well as retropubic prostatectomy. Other cases have been encountered independent of operative procedures. The reason for this complication is not known. Postoperative hemorrhage is a possibility but rarely occurs. Drainage of urine through the wound may occur but is of little importance and always stops following the insertion of a retention urethral catheter. There are no persistent fistulae. Urethral stricture, so common after transurethral resection, is not encountered after retropubic prostatectomy any more than one would expect it to follow suprapubic enucleation. The reason for its absence is lack of trauma to the urethra.

SUMMARY

The retropubic approach offers a number of advantages over other methods for removal of prostatic obstruction produced by true benign hypertrophy. The approach is direct, is anatomically sound and does not endanger or disturb other important organs. It permits removal of all obstructing tissue, so that the possibility of recurrence is eliminated. Patients with poor renal and cardiac function appear to tolerate the retropubic operation better than any other type of total prostatectomy. Early ambulation is permitted and there is relatively little discomfort in the postoperative period. The end results of the operation are most gratifying.

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RETROPUBIC PROSTATECTOMY*

ROBERT K. WOMACK, M. D.

AND

BURDETT E. TRICHEL, M. D.

SHREVEPORT

During the past year considerable interest has been aroused among urologists over a new surgical approach to the prostate gland, namely retropubic prostatectomy. Although one finds an occasional reference in the literature to an extravasical suprapubic approach to the prostate, even dating back as early as 1909, it remained for Terence Millin of London, England, to place this surgical procedure on a sound basis and to popularize this method of prostatectomy.

Just why the early investigators abandoned this route is not clear, but in all probability postoperative sepsis played a prominent role in discouraging this procedure. Today, antibiotics, sulfonamides, improved surgical technics as well as improved instruments, especially catheters, have removed many of the previous difficulties and complications in any type of open surgery of the prostate gland.

Millin claims the following advantages for this procedure: (1.) It is an extravasical procedure, which avoids suprapubic bladder drainage and the risk of persistent fistula. (2.) It does not interfere with, or endanger, any important organs. (3.) It is relatively short, and relatively shock free. (4.) All the obstructing tissue is removed, minimizing the risk of recurrent obstruction. (5.) The postoperative course is, as a rule, very comfortable for the patient, and easy for the attending staff. (6.) Relatively short postoperative hospitalization. (7.) Extremely low mortality rate.

Needless to say, the preoperative preparation of the patient is the same as for any other type of prostatic surgery, namely

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investigation of renal function, cardiovascular studies, etc.

In a recent publication Millin reports his experiences with 402 cases with a mortality rate of 4.75 per cent. In this country, Bacon reports on 32 cases with 1 death occurring postoperatively due to coronary occlusion, which was proved at autopsy. He concluded that this procedure is anatomically sound, there is little danger of postoperative hemorrhage, persistent fistula, prolonged infection or urethral stricture. He also states that it minimizes the danger of postoperative incontinence and impotence. He does not consider it applicable to prostatic fibrosis, bladder neck contraction, or extensive carcinoma.

Lowsley reports a series of 28 cases with no deaths. He concludes that this method of prostatectomy is possible in almost every type of prostatic obstruction, but is feasible in many cases of large adenomatous prostates, when the patient's general condition does not warrant a traumatizing operation, when a short period of hospitalization is a consideration and when the maintenance of sexual functions is to be considered. In his hands the results were most gratifying, as the convalescence was very rapid. There were no deaths, no persistent fistula and no postoperative incontinence of urine.

Grant reports a series of 65 cases without a death, and in comparing this method with the perineal prostatectomy his conclusions were as follows: (1.) The operation is more simple than the perineal. (2.) It is equally shock free. (3.) There is less wound discomfort. (4.) There is quicker healing, and shorter hospitalization. (5.) Less danger of incontinence and impotence. (6.) It is possible to perform radical prostatectomy in early carcinoma equally as well by this route as by the perineal.

Briefly, the technic of this procedure is as follows: Through a midline suprapubic incision the recti muscles are separated, the bladder is pushed backwards and the retropubic space is exposed. At this point the prostate, the vesicoprostatic junction, and the bladder can be easily identified. Usually one encounters one or more periprostatic

veins in the loose areolar tissue overlying the prostate. These are ligated and divided. Inspection of the prostatic capsule will usually show one or more large capsular veins coursing through the substance of the prostatic capsule. These are under-run and ligated with chromic O. A transverse incision is then made through the capsule of the gland between the apex and the base. This incision should be made as short as possible, depending on the size of the adenoma, and extended through the capsule until the adenomatous tissue is recognized. By blunt dissection, either with curved scissors or with the finger, the hypertrophied lobes are enucleated, the urethra is cut across near the apex of the prostate and lifted up out of the prostatic bed. It is then dissected free from the overlying bladder mucosa around its base and removed under vision from the vesical orifice. Bleeding will usually be encountered from the branches of the cystic arteries on each posterolateral edge of the bladder neck. These are best controlled by a figure-of-eight or running suture of fine chromic. If the vesical orifice is contracted, a V-shaped wedge of tissue is removed from the posterior vesical lip. A catheter, preferably a Foley, size 20 or 22, is passed through the urethra where it can be seen emerging into the prostatic fossa, and guided into the bladder under vision. The balloon is inflated, the bladder is irrigated to remove clots, and the capsule of the prostate is then closed, using either interrupted or continuous suture of chromic O. A small rubber drain is placed in the retropubic space and the wound is closed in layers in the usual manner.

When the patient is returned to his bed, the catheter is connected to a receptacle and is not irrigated, unless it becomes occluded by clots. As a rule, the urine is blood tinged on the day of operation, but is usually clear by the second or third postoperative day. There is very little postoperative pain or discomfort, and the patient is allowed to be out of bed on the second postoperative day. The prevesical drain is removed in seventy-two hours, and

the catheter on the fifth, sixth or seventh day, depending upon the individual case. As a rule, there is no leakage of urine and the catheter can be safely removed in five days, sometimes sooner.

This presentation is based upon our observations in 31 cases, which have been done during the past six months at the Shreveport Charity Hospital. We have been impressed with the absence of shock, the smooth postoperative convalescence and the relatively easy postoperative care of the patient. There have been no deaths in this series. The average postoperative stay has been sixteen days. However, several of these patients could have been dismissed sooner, but were waiting on relatives to provide transportation to their homes in distant locations.

We believe this to be an ideal method of removing the medium-sized and fairly large hyperplasias. In our experience, prostates weighing under 20 grams have proved to be difficult to enucleate. We prefer the transurethral method in the small adenomas, fibrotic prostates, contractures of the vesical orifice and carcinoma of the prostate. There has been no case of persistent incontinence. One patient had a temporary diurnal incontinence, but this disappeared within four weeks.

THE TREATMENT OF ACUTE BRUCELLOSIS

T. B. TOOKE, JR., M. D.*
SHREVEPORT

Brucellosis belongs to that ever dwindling group of infectious diseases for which no specific therapeutic agent yet has been found. Until the discovery of the sulfonamides there was no drug or therapeutic plan which yielded encouraging results in any more than an occasional case. The era of chemotherapy and the antibiotics, beginning something more than a decade ago, has

been marked by conflicting reports as to the efficacy of the various drugs used in the treatment of brucellosis but on the whole one can be encouraged even though success has been incomplete. Before proceeding with the discussion of these newer and apparently more effective drugs some of the older drugs and methods deserve mention.

OLDER TYPES OF THERAPY

Vaccine Therapy: For the most part *Brucella* vaccine has been reserved for the treatment of chronic cases of the disease. There is no unanimity of opinion that such a vaccine is specific for brucellosis. Carpenter and Boak¹ conclude that a specific effect is lacking and that favorable results are due to nonspecific systemic reactions. Evidence for this is that favorable results have followed the intravenous injection of typhoid vaccine. If used at all *brucella* vaccine should be used in combination with one of the more recent therapeutic agents for whatever increase in immune bodies it might bring about in the host.

Immune Serum: The use of specific antisera prepared for immunizing animals has not been accompanied by very encouraging results. Human immune serum would appear to be of some value.² I have had no experience with it, but here again it would seem the best plan to use antiserum in combination with a more effective drug.

Fever therapy: Fever therapy by means of the hypertherm has been used and reported³ to be of some value, particularly in cases complicated by bone or joint lesions.

CHEMOTHERAPY AND THE ANTIBIOTICS

Sulfonamides: Soon after the discovery and beginning clinical use of sulfanilamide, encouraging reports began to appear in the literature which indicated that brucellosis would respond to this drug.^{4, 5, 6} On the other hand results have since been presented which tend greatly to minimize the value of the sulfonamides as a curative agent.^{7, 8} However, as late as 1945, Spink and his associates² expressed the opinion that in their experience the sulfonamides were effective in the treatment of *Brucella* infections. In a later report Spink, *et al.*,⁹

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obtained recovery in 6 out of a total of 20 cases treated with sulfadiazine alone.

Penicillin: Enthusiastic use of this drug in the treatment of brucellosis followed its discovery, but it has since been more or less universally agreed that penicillin is ineffective either alone or in combination with any other drug.

Streptomycin: This drug enjoyed a somewhat better reception from early investigators and it was at first thought to be quite effective, but it has failed to live up to these early expectations. In a group of 7 cases treated by Spink *et al.*,⁹ with streptomycin alone recovery did not occur in a single case. As an example of the conflicting reports, however, Finch¹⁰ has reported within the past several months that he "obtained excellent results in 6 cases treated with streptomycin alone." The weight of evidence indicates that streptomycin is not as effective used alone as is one of the sulfonamides.

Combined Sulfonamide - Streptomycin: According to very recent reports the combination of streptomycin and sulfadiazine appears to be the most specific and most effective method of treatment of brucellosis that has been used up to the present time. The initial report of the use of this combination by Eisele and McCullough was that of a single well-controlled case that was apparently cured. Pulaski and Amspacker¹² report favorable results in 3 cases treated in a similar fashion. Spink *et al.*⁹ have presented the most convincing results to date. In a group of 9 cases they observed very favorable results in all cases. The follow-up period of observation in the majority of these more recently reported cases, however, has been relatively short so that undue optimism should not be premature as it has been in regard to other forms of treatment.

The following group of 8 cases which I wish to present in brief summary have

been, with one exception, treated with a sulfonamide compound alone or with sulfonamide in combination with Brucella vaccine. Streptomycin either was not discovered or was not readily available at the time that the majority of these cases occurred. All of these cases are examples of acute brucellosis, the one of longest duration being six weeks. Only 1 case showed demonstrable evidence of a complicating lesion and this case ended fatally. The diagnosis of all cases was made on the basis of the clinical picture, agglutination tests positive in quite high titers, and the exclusion of any other cause for the illness. The diagnoses were made without the aid of positive blood cultures. This test is admittedly the most valuable single diagnostic procedure when positive, but the technical difficulties of culturing the organism are great. According to Harris¹³ the brucella organism is among the most difficult of all bacteria to isolate and unless a laboratory is staffed and equipped with special interest directed toward the isolation of this organism the diagnosis must be made without benefit of such definitive proof. On the other hand, if the agglutination test is positive in high dilution it can be accepted as proof of the diagnosis, particularly when the clinical findings are consistent with the diagnosis of this disease.

SUMMARY

Of seven cases treated with sulfonamides with or without vaccine 4 got prompt and permanent remissions. All received sulfanilamide. Two cases relapsed, one of which got second remission and has since been well. The other has not been followed enough to judge. One case treated with sulfadiazine and streptomycin must be considered a failure.

CONCLUSION

The sulfonamides particularly sulfanilamide appear to be of definite value in the treatment of acute brucellosis.

TREATMENT AND RESULTS IN EIGHT CASES OF ACUTE BRUCELLOSIS

	AGE	SEX	RACE	DURATION SYMPTOMS	PHYSICAL FINDINGS	AGGLUTINATION TITER	TREATMENT	RESULTS AND FOLLOW-UP
Case 1 O. E. B. 7-29-43	50	M	W	6 wks.	Liver & spleen palpable	1:2000	Sulfanilamide 6 gms/day for 2 wks. followed by vaccine.	Prompt remission. No relapses in 5 yrs.
Case 2 W. B. 11-7-45	35	M	W	1 mon.	Spleen enlarged	1:6400 1:9600	Sulfanilamide 6 gms/day for 2 wks.	Prompt remission. No relapses in 3 yrs. Excellent health.
Case 3 J. W. G. 10-7-47	55	M	W	3 wks.	Liver & spleen enlarged	1:3200 1:40,000	Sulfanilamide 6 gms/day 2 wks. Vaccine	Prompt remission. No relapse in 7 mon.
Case 4 J. B. S. 9-21-43	58	M	W	2 wks. (?)	Liver & spleen palpable and tender	1:8000 1:10,000	Sulfanilamide 6 gms/day. Discontinued after 8 days because pa- tient left hospital	Prompt excellent re- mission. Relapse 6 wks. later. Patient developed paraplegia and expired after 5 wks. in spite of all treatment. Autopsy revealed transverse myelitis and patho- logic lesion of myo- cardium, liver spleen and testes, consist- ent with brucellosis.
Case 5 G. H. 8-14-46	25	M	W	5 to 6 wks.	Negative	1:640	Sulfanilamide 6 gms/day for 10 days	Prompt and com- plete remission. No relapses. Excellent health.
Case 6 K. B. 4-29-46	38	M	W	2 wks.	Negative	1:320 1:1600	Sulfadiazine 6 gms/day 2 wks. Vaccine	Remission. Relapsed 3 to 4 months later but got second re- mission and has re- mained well.
Case 7 J. M. C. 10-19-47	50	F	W	5 wks.	Negative	1:6400 1:8000	Sulfadiazine 14 days Vaccine	Remission, but re- lapsed in January 1948.
Case 8 A. C. M. 11-12-46	34	M	W	2 wks.	Negative	1:6400	Sulfadiazine 2 wks. Streptomycin 2 wks. over- lapped 3-4 days	Never got complete remission. Follow- up unsatisfactory.

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CERTAIN PRACTICAL CONSIDERATIONS IN GASTROSCOPY*

CARL H. RABIN, M. D.

NEW ORLEANS

Some twenty years ago a distinguished English surgeon, one of the great cancer specialists of the world, said of esophagoscopy and gastroscopy that the physician who employed these aids to diagnosis must be endowed with the eye of a hawk and the instincts of a sword swallower. His remark was probably justified in a day when only rigid instruments were available. But in 1932 the flexible gastroscope was introduced, and gastroscopy promptly became the useful adjunct to the diagnosis of gastric lesions which gastroenterologists and other physicians had been trying to make it ever since 1868, when Kussmaul first endeavored to examine the stomach—of a sword-swallower—with a straight metal tube with flexible obturators.¹

It is a far cry, of course, from gastroscopy as it was practised in 1932 to gastroscopy as it is practised today. The instruments used for the procedure have been successively improved and details of technic have been greatly simplified. More important, with increasing experience, the physicians who use this diagnostic aid have become increasingly expert in the interpretation of their observations. Over the last decade—a period which includes an interruption of five years of military service—I have myself performed more than a thousand gastroscopies, and I can testify to the difference in both technic and results which comes with experience.

INDICATIONS AND CONTRAINDICATIONS FOR GASTROSCOPY

In spite of the recent advances in gastroscopic technic and the growing appreciation of its value in the diagnosis of gastric lesions, numerous and widespread misconceptions still exist as to its place in the

diagnostic armamentarium. The most common and most important of these misconceptions is the belief that gastroscopy is in competition with roentgenology. It is not. The two methods are complementary. One supplies information which the other does not, or one confirms the tentative or positive observations of the other, or one or the other stimulates the physician to further investigation.

Roentgenologic examination should always be performed before gastroscopy, for a number of reasons, one of the most important of which is to determine the configuration of, and other details concerning the esophagus which are essential before gastroscopy is undertaken. In institutions in which the two methods are regarded in the proper perspective, the situation is likely to develop which Benedict² commented on in a discussion of the set-up at Massachusetts General Hospital: The largest number of requests for gastroscopy came from the department of radiology.

If gastroscopy could be performed regularly as part of the diagnostic routine it would be highly desirable. It cannot, of course, if only because there are not enough trained gastroscopists to permit it. Gastroscopy is definitely indicated, however, and should not be omitted in (1) cases in which the question of medical versus surgical treatment has arisen; (2) cases of unexplained gastrointestinal hemorrhage; (3) cases in which roentgenologic studies have revealed no lesion but symptoms referable to the gastrointestinal tract persist; and (4) cases in which no organic basis can be found for gastrointestinal complaints or for unexplained loss of appetite or weight. Gastroscopy is also a useful method of confirming the roentgenologic diagnosis of gastric ulcer and gastric cancer, of following the healing process in a gastric ulcer, and of following the course of syphilitic disease of the stomach under specific therapy.

The chief contraindications for gastroscopy are picked up in the course of careful history-taking and careful physical examination. It is important, for instance, to

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identify irregularities in the formation of the jaw or teeth and the presence of gaps between the teeth, to identify abnormalities and deformities of the spine, and to determine the existence of cardiac and cardiovascular abnormalities and hepatic enlargements. Fluoroscopy of the chest is essential in cases of suspected aneurysm or mediastinal tumor. Enlargements of the liver suggest the possible presence of varices of the esophagus. Other contraindications include all types of esophageal obstruction; angina pectoris, cardiac decompensation and other cardiac diseases; dyspnea; corrosive gastritis; abdominal rigidity and other evidences of peritoneal irritation; and the various psychoses. Some of these conditions constitute absolute contraindications to gastroscopy. Some of them are only relative. If they are relative, it is always necessary to weigh the possible risks of gastroscopy under the circumstances against the necessity for determining the exact intragastric status.

THE ROUTINE OF GASTROSCOPIC EXAMINATION

Gastroscopy is not technically difficult when once the method is mastered. Its mastery, however, implies careful and precise training and long experience. Furthermore, no matter what are the qualifications of the physician, gastroscopy cannot be properly carried out without unremitting attention to detail. With care the procedure can safely be carried out in the office but it is preferably performed in the hospital. The following routine is advised:

The examination is best carried out early in the morning. The patient is permitted nothing by mouth after midnight, and gastric lavage is done just before gastroscopy is performed, if roentgenologic examination has shown any gastric retention, or if the clinical history suggests an obstructive lesion.

Thirty to forty-five minutes before the examination, the patient is given morphine, gr. 1/6, and atropine, gr. 1/100, by hypodermic. It is important that he be completely relaxed and entirely free from apprehension, and sedation is employed routinely to achieve this status. I prefer to

postpone an examination rather than carry it out on a nervous, apprehensive, unrelaxed patient.

Immediate preparation consists of two steps, abolition of the gag reflex and drainage of the stomach. The first objective is accomplished by painting or spraying the buccal and pharyngeal mucosa with pontocaine (2 per cent) or introducing the anesthetic agent through a special tube. Anesthetization, in addition to abolishing the gag reflex, does away with pain over pressure points in the mouth when the tube is passed. Drainage of the stomach is best accomplished by means of a Ewald tube. After it is passed, the patient is placed with the head lower than the stomach, in which position drainage is merely a matter of gravity. It is essential that the stomach be completely empty. The presence of even insignificant secretions over the surface of a lesion may give rise to misleading conclusions.

The gastroscope is passed with the patient in the left lateral position. The end of the instrument is introduced into the mouth and is guided by the left index finger until the tip touches the posterior wall of the pharynx. It is then pushed forward while the patient goes through the motions of swallowing. If it has been properly introduced, it passes easily beyond the inferior constrictor muscle of the pharynx as the muscle relaxes during the act of swallowing. It then enters the esophagus and within a matter of three seconds thereafter the tip is in the lowermost part of the stomach. All maneuvers should be gentle and exact, but there should be no undue delays. If there are, the muscular ring of the esophagus and the muscularis propria of the stomach will be given time to become tetanically contracted and a satisfactory examination will be impossible. If resistance is felt when the instrument approaches the cardia, it must be withdrawn at once, and, generally speaking, it should not be reintroduced until the roentgenograms have been restudied and esophagoscopy has been performed.

When the gastroscope has been satisfac-

torily inserted, the electric current is switched on, air is slowly introduced into the stomach, and examination of all parts of the gastric wall is carried out in a systematic manner. Examination of all parts of the stomach can be carried out under direct vision, with the exception of the three so-called blind spots. One of these is a small portion of the posterior wall, against which the gastroscope lies, making distention with air impossible. The second, and far more important, is the lesser curvature of the antrum, which, because of the angulus, cannot be properly visualized. The third blind area is a small portion of the fundus. The physician who undertakes gastrosocopy must never forget the existence of these blind spots in either his technic or his interpretation of his observations.

GASTROSCOPIC OBSERVATIONS

The gastroscopist must, of course, be thoroughly familiar with the gastrosocopic appearance of the normal stomach. Its mucosa is orange-red, smooth, and glistening. It has the appearance of silk and it presents many small highlights. Numerous intersecting and parallel folds are seen.

It would be impossible within the limits of this presentation to describe adequately the gastrosocopic appearance of the various gastric lesions, but certain important points concerning them may be mentioned:

A benign gastric ulcer stands out as a contrasting white or yellowish-white area in the normal orange-red field of the gastric mucosa. The shape is usually round but may be elliptical. The edges are sharp. A benign gastric ulcer never blends with surrounding mucosa. The floor is always depressed. The ulcer is characteristically craterlike; less often it is funnel-shaped. Its depth varies.

A gastric cancer may present four gastrosocopic appearances:

1. The polypoid type of cancer, to which the papillomatous type also belongs, has a broad base which supports numerous prominent, solid, hemispherical elevations of various sizes. The edges of the growth are sharply limited. The color is generally the same orange-red as that of the normal sur-

rounding gastric mucosa. A polypoid carcinoma in the late stages is characterized by shallow ulcerations.

2. The non-infiltrating carcinomatous ulcer is usually large and usually has raised margins of variable thickness which do not seem to extend into the adjacent tissue. The color of the margins is usually dark red, so dark that the adjacent orange-red normal mucosa appears pale by contrast. The floor of the ulcer is extremely irregular. It is likely to be covered by bits of necrotic tissue and it may be dirty-gray, greenish-gray, brown, reddish or violet.

3. The infiltrative carcinomatous ulcer lies in the center of a distinct elevation. The floor, though it may be of many colors, is most often whitish or brilliant white. The ulceration blends into the surrounding mucosa, which is evidently infiltrated.

4. The diffuse infiltrating type of carcinoma assumes two forms. One is that of the so-called leather bottle stomach, the existence of which should always be suspected when the stomach cannot be satisfactorily inflated. The second type is the scirrhus or medullary type, which is easy to diagnose when ulceration has occurred but difficult when it has not. Early malignant infiltration can be recognized only by localized rigidity of contour or by the presence of an area of mucosa over which peristalsis is absent. Careful fluoroscopic examination is essential for early diagnosis. The gastroscope cannot be relied on early in the disease because involvement of the mucosa is not an early development.

Gastrosocopy probably has its greatest field of usefulness in the diagnosis of gastritis, which cannot be accurately identified by any other method. Jones³ warning, however, should be borne in mind, that the term gastritis is not used by all gastroscopists with equal accuracy and understanding.

Gastrosocopic observations indicate that there are four chief types of gastritis:

1. Chronic superficial gastritis, manifested by reddening of mucosa, edema of the mucosa, and increase of the normal gastric highlights. Exudation is character-

istic, and dirty-gray, adhesive, semipurulent mucus is the rule. Approximately 20 per cent of all cases of superficial gastritis go on to atrophic gastritis.

2. Chronic atrophic gastritis, which may be localized or diffuse. In this variety of disease the mucosa is thin, gray or greenish-gray and is so thinned out that blood vessels are sometimes visible beneath it. Atrophic gastritis usually accompanies pernicious anemia and is so uniformly associated with carcinoma of the stomach that it is best to regard it as a premalignant lesion.

3. Chronic hypertrophic gastritis. In this type of disease the mucosa is velvety and the normal highlights are diminished or are completely absent. Pathologic changes are first apparent between the mucosal folds, but eventually the entire mucosa has a segmented cobblestone or granular appearance. In advanced, severe cases it is hemorrhagic.

4. Postoperative gastritis may appear in any combination of the forms just described.

Benign tumors of the stomach, of which the most frequent are polyps and fibromyomas, may be the cause of profuse gastric hemorrhage. Both varieties are frequently associated with atrophic gastritis. A gastric polyp is a premalignant lesion and its demonstration in a roentgenogram should be regarded as an indication for immediate gastroscopy and for surgical exploration if the differentiation between malignancy and benignancy cannot be made definitely and promptly.

Certain other points of technic and interpretation might be briefly mentioned. Distention of the stomach with air is of considerable value in the differentiation between gastritis and carcinoma: An area which is the site of gastritis will flatten out as distention occurs, but a carcinomatous lesion will not. Palpation of the stomach during gastroscopy, just as during fluoroscopy, may bring a hitherto unseen lesion into view and indicate whether it is rigid or pliable. If after the gastroscope has entered the stomach it advances with

difficulty, the presence of a neoplasm of some sort should immediately suggest itself.

Benedict's^{2, 4} interesting studies of proved gastric lesions diagnosed by roentgenologic and gastroscopic methods indicate that both methods are more accurate in carcinoma than in ulcer, one reason being that in gastric ulcer, whenever there is doubt as to the character of the lesion, both radiologist and gastroscopist prefer—quite wisely—to err on the side of gastric carcinoma. Benedict also notes that while the gastroscopic diagnosis of carcinoma has improved as time has passed, the diagnosis of ulcer has not materially improved. One reason is that mechanical improvements in the instrument have not been of great help in the visualization of the lesser curvature of the antrum and the prepyloric area, where many small ulcers occur. Benedict calls attention to the instrument devised by Hermon Taylor, which permits proximal control of the flexible part of the gastroscope and which his own experience has shown to be most useful in visualizing lesions high on the lesser curvature and the posterior wall. This instrument is only just coming into general use in this country.

Generally speaking, the gastroscope supplies a better picture of mucosal changes and superficial ulcerations than does the x-ray. It is of particular value, as Schindler⁵ has recently emphasized, in the diagnosis of small, early, symptomless gastric cancers, the most favorable of all cancers from the standpoint of resection and the most hopeful from the prognostic standpoint. Penetrating ulcer craters, however, located on the lesser curvature of the antrum, cannot be seen by the gastroscope and must be diagnosed by roentgenologic methods.

SUMMARY

Gastroscopy is now an established method in the diagnosis of gastric lesions. It is complementary to roentgenography of the stomach, not competitive. It is contraindicated under certain conditions and should be performed in their presence only when the possible risk is fully realized. It is of particular value in the diagnosis of

gastric ulcers, gastric cancers, and benign gastric tumors, and it is indispensable in the diagnosis of gastritis. Gastroscopy is an extremely useful diagnostic aid, but its mastery requires precise training, much experience, and unremitting attention to details.

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HERPES ZOSTER THERAPY: PAIN RELIEF BY SIMPLE PROCEDURE

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NEW ORLEANS

The literature on herpes zoster in the past decade reveals essentially no progress in our knowledge of its etiology and pathology. The causative agent is presumed to be a filterable virus, localizing particularly in the sensory ganglia of afflicted areas. The work of Goodpasture¹ suggests that the involved epithelial cells may also harbor the virus. Interference with vision is notable in the ophthalmic forms of this disease, and the possibility of attack on motor nerves is suggested from concurrent muscular paralysis in a few cases.

The report by Gundersen² on the use of convalescent serum for cases with herpes zoster ophthalmicus may in time contribute to our immunological understanding of this disease, apart from its merits in relieving pain and promoting healing in the eye.

In the treatment of herpes zoster the main interest appears to be directed toward control of pain. When skin areas involved

are small, this aim is probably adequately met by a great variety of medicaments.

For larger areas the sedatives and opiates do not fill the need. When roentgen rays are used to appropriate skin and spinal areas, relief, if obtained, is not likely to appear before a lapse of twenty hours. The discovery that the small and daily administration of posterior pituitrin could give prompt and dramatic relief of pain has been verified to occur in a relatively small percentage of cases. As a result the administration of pituitrin is widely resorted to, only to provide much disillusion.

In 1945 and 1946 there appeared two interesting reports on the use of procaine block of the paravertebral sympathetic ganglia. The reports of Findley and Patzer,³ and by Lowell,⁴ claim the procedure to be simple and harmless, even to making "all other methods obsolete."

The simple procedure for the relief of pain in herpes zoster reported in this paper is the result of clinical studies with carbon tetrachloride applied topically to skin areas suffering from pain and pruritis under a variety of pathological conditions. (Fasting⁵)

The procedure in herpes zoster consists in sponging off the afflicted skin area with a small amount of carbon tetrachloride (commercial) using a cotton sponge preferably to gauze or other material.

All other forms of therapy that aim to treat vesicles and pustules are minimized, and may even be dispensed with. It will be observed also that the "dry cleaning" process with carbon tetrachloride introduces a relative "dessication" and disinfection of the skin peculiar to lipid solvents.

REPORT OF CASES

Prompt relief from pruritis was first observed in two cases having a limited involvement over the iliac crest and adjoining groin. The vesicles had already reached the stage of encrustation, but pruritis was continuous and only annoying. Both patients were furnished with a few ounces of carbon tetrachloride to repeat the applications as needed.

A case of herpes zoster on the leg of a white male was similarly treated with sat-

isfaction by a collaborating physician.⁶

In a fourth case a soldier in one of the camps was similarly treated by an army medical officer who had observed the treatment and results in one of the patients in Charity Hospital listed below.

Colored female, E. F., age 58, entered Charity Hospital clinic on June 1, 1945. For two weeks there had been pain in the right arm and right side of thorax. A week before entry vesicles appeared on the same arm, the upper side of chest and over the right scapula. Pain became progressively worse. The clinic diagnosis was herpes zoster of entire right arm and part of thorax. While in the clinic and in the presence of physicians, the patient's afflicted parts were sponged off with carbon tetrachloride, a total of 1 ounce being used. Relief of pain was instantaneous. The patient was admitted to the hospital with instructions for the application of carbon tetrachloride every four hours or as needed for the pain. A fever of 101° F. on admission had disappeared the next day. The record indicates a return of pain at times and that reapplication of carbon tetrachloride relieved same. The patient was discharged four days later. She reappeared at the clinic in the following months of July and August. The notes indicate a little pain in the remnant scars of herpes zoster. Two years later she returned to clinic complaining of asthma and possible sciatic pain.

Colored female, M. G., age 50, entered Charity Hospital clinic March 16, 1945. Three weeks prior to entry patient noted blisters on left side of chest. Area was painful and pain continuous. Blisters kept increasing in number and no medication had been used. Physical examination appeared essentially negative, except for a mass of vesicles forming a 4 to 5 cm. wide band extending from the spinal column to the sternum over the middle of the left side of the thorax. While in the clinic the area was sponged off with carbon tetrachloride and immediate relief of pain resulted. This took place at 10:30 a. m. The patient was placed in the ward for further observation. Pain reappeared at 1:00 P. M., but was not treated until 4:00 P. M., when immediate relief was obtained with carbon tetrachloride. At 5:00 P. M. pain reappeared, this was treated at 6:00 P. M. Two additional applications were made at 7:30 and 9:00 P. M.

The next day, March 17, 1945, treatment was given at 10:30 a. m. on complaint of pain. Apparently no further treatments were given that day or night.

The following three days carbon tetrachloride was administered as a routine in the morning. Four days after entry the order for carbon tetrachloride was arbitrarily changed to calamine lotion by a resident. Two applications were made and the patient was discharged to the clinic.

Three weeks later the patient appeared in the

clinic. The vesicles were dry and the patient had no pain. Further course appears of no consequence.

COMMENTS

Carbon tetrachloride is a fat and lipid solvent resembling chloroform in anesthetic and toxic properties. It seems fair to assume that the relief of pain obtained in these patients resulted from a direct action of carbon tetrachloride on the peripheral nerve endings. While a certain cooling effect was obtained from the rapid evaporation, it is difficult to credit this action with significant anodyne effect.

Admittedly a larger series of patients must be studied. It will be equally necessary to consider the different regions of the body and complicating factors to properly evaluate this procedure. To gain a better understanding of the action of local anesthesia, recall to mind that the topical application of known anesthetics is not likely to exert any significant anodyne action on normal skin but does so under pathological conditions, i.e., nupercaine ointment in sunburn.

It seems appropriate to call attention to a few other properties of carbon tetrachloride. It does not cause blistering of the skin. This is a contrast to chloroform. As a non-inflammable and non-explosive solvent, heavier than air, it has advantages over ether and benzene for cleaning the skin, removing adhesive, and acting as a disinfectant.

A few individuals will be found skin sensitive to this solvent. According to certain statistics in industrial dermatoses, this percentage is as small as that found for gasoline and other petroleum products.⁸

A consideration of the use of carbon tetrachloride should take into account the literature pertaining to its toxicity. By far the largest majority of toxic cases are the result of protracted inhalation of the fumes in closed rooms. Flagrant violations of simple precautions for handling industrial solvents have been found responsible for this condition.

The remaining reports of toxicity appear due to accidental ingestion of amounts larger than the prescribed therapeutic

doses. Not a single case of carbon tetrachloride poisoning has been encountered in the literature, where dermal penetration was the exclusive mode of entry or contact.

In the two cases of herpes zoster that were hospitalized for reasons of observation and records, it was found that 1 ounce of carbon tetrachloride sufficed for the rapid sponging of an entire arm and the adjoining pectoral and scapular surfaces. That the largest part of the carbon tetrachloride evaporated would seem obvious. Apparently only a small amount of the solvent need make intimate contact with nerve endings and other absorptive structures of the skin for adequate clinical response. Only further investigation can disclose if some modification in applying the solvent can reduce the waste and remain equally effective.

It is well to give consideration to the cost of medication employed. Carbon tetrachloride U.S.P. is carried in small amounts by druggists and its cost is high. The commercial grade of carbon tetrachloride as used in dry cleaning and in certain types of fire extinguishers is reasonably priced and is safe for external use. Druggists should be encouraged to stock the commercial grades.

The simplicity of this method, combined with the features of cleansing and antiseptics, should be an inducement to try carbon tetrachloride as a first step in the treatment of herpes zoster. It in no way precludes or interferes with any other form of therapy the physician may choose should the objective of pain relief fail or prove inadequate.

CONCLUSION

Carbon tetrachloride deserves trial for the relief of pain in herpes zoster. Only small amounts are required for sponging off afflicted areas. Danger of toxicity is not warranted when the solution is dispensed in small amounts and used with the conventional precautions.

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OFFICE FLUOROSCOPY*

D. M. MOORE, M. D.

MONROE

This writer was asked to prepare a paper on this subject that would benefit the many men who have some type of x-ray equipment in their office and expect to use it to some advantage in the handling of the every day run of patients in their practice. When used properly such equipment may be of great value, but many are not versed in its use and fail to get all that is expected from it. We hope to give you some helpful suggestions as to its use but we do not intend this as a postgraduate course in a very highly technical specialty.

By way of warning, an x-ray machine is a potential source of danger both to the operator and the patient. The production of useful x-rays begins at about 25,000 volts of electricity—a deadly current if not properly controlled. Many men have paid with their lives either through ignorance in the use of x-ray or through accident. A voltage up to 100,000 volts is commonly used to penetrate an average human body; such a voltage is likewise used in skin or superficial therapy. The flow of current through the tube is measured in milliamperes, usually 5 to 7 depending on the preference of the operator. This will deliver approximately 30 to 50 roentgen units to the skin per minute and an erythema dose will be administered in from ten to fifteen minutes total time. The operator's hands may be exposed as well as the body

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of the patient. The patient may get a disagreeable reaction but the operator by repeated exposures may receive severe damage to not only his hands but his body as well. You probably invested several thousand dollars in this machine and it may be well to invest a few more dollars in protecting gloves, aprons, goggles, etc.

Many doctors tell me that they can not see anything under the fluoroscope. This is because they have not properly prepared their eyes for it. The operator should invest in a pair of good fluoroscopic goggles and put them on ten or fifteen minutes before examining a patient, or sit in the dark room for a similar period of time to get the proper eye accommodation to darkness. This is very essential if you expect to see the changes flashed on the screen. Do not step on the switch and hold it for long periods of time, as you will soon use up your time limit and at the same time overheat the tube. Take a rapid survey and contemplate in the dark for a few moments on what you saw, then another brief flash to confirm or rule out what you first thought you saw. If you are reducing a fracture, note what is to be done and do it in the dark then recheck and thus get the desired results with a minimum of exposure. If you are searching for a foreign body set your voltage to correspond to the thickness of the part and use the shutters to confine the rays to the area under investigation. If the body is small this is very essential or the particle may be overlooked.

Possibly the most valuable use for the fluoroscope is that of inspecting chests. A normal chest on an individual of medium build should show brilliantly illuminated lung fields on each side of the chest, slightly increased on deep inhalation along with increased size of the lung fields. At the end of expiration the patient is instructed to cough without another inhalation. This should produce what is known as the "cough flash" and indicates normal lung tissues as a general rule. Note the mobility of the diaphragm during deep respiration; pleural fixation or phrenic nerve paralysis will limit the excursions on the affected

side. Look for fluid levels with the patient in the upright position usually, or if too ill to stand, have him lie on the good side and inspect in that position. Consolidation of a lobe will show a dense or dark shadowing. Bronchopneumonia may be seen in or about the hilar region possibly on both sides. Shadowing in the apex may be one of several conditions such as tuberculosis, pneumonia, tumor or pocketing of pus. Under no circumstance label a patient as tuberculous simply because you see a shadow in the chest. A good diagnostic plate is essential for a differential study and the proper determination of the condition present. A pulsating mass may be seen and it is necessary to determine whether the pulsation is in all directions, such as is the case with aneurism, or is due to the impact of the heart or great vessels on a more or less solid mass giving it the appearance of pulsation.

Another important feature of a fluoroscopic examination is that of displacement of organs or other structures out of their normal position. It is well to remember that an organ may be pushed or pulled out of its normal position. An expanding mass of tumor or fluid may push an organ, while a fibrosing process with its inevitable contractions may pull an organ out of position. For instance take the position of the heart; do not spend all of your time looking for a pushing process but inspect the opposite side for a pulling process.

Rotation of the patient while under fluoroscopic observation is another device that pays good dividends when properly used. A pocket of pus in the pleura is a good example of this. The shadow observed will change as the patient is rotated and its direction will tell you whether it is near the screen or near the table. Keep in mind a turning wagon wheel and if you turn the patient to the right and the shadow travels to the left it is in the back side of the chest and vice versa, and if the pocket is on the front side of the chest it will move in the direction of the rotation. This is well to remember while locating a foreign body. Also, when the foreign body approaches nearest the skin surface a lead pencil should

be pressed on the skin perpendicularly to the rays and moved to adjacent points until the maximum amount of motion of the foreign body is observed. You will then be in position to make a mark on the skin directly over the foreign body at the point it is nearest the skin surface. The surgeon can, in many instances, cut down on the body and remove it without further assistance. If he fails to locate the foreign body after diligent search, a forcep can be inserted into the incision to grasp the object under fluoroscopic guidance and removed after lights are turned back on.

THE NONSURGICAL TREATMENT OF SQUINT

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For the purposes of this discussion, which will be limited to the nonparalytic, manifest types, a squint (*strabismus*) may be defined as any deviation of the eyes from parallelism, for either near or distance vision, which is manifest to an observer.

Certain other definitions and classifications are necessary at the beginning of such a discussion. Manifest squints are divided into the horizontal and the vertical types. In the horizontal variety one or both eyes turn inward or one or both eyes turn outward. In the vertical types one or both eyes turn up or down. All manifest squints are termed tropias. Internal deviations, which are also known as crossed eyes or internal *strabismus*, are termed esotropias. External deviations, which are also known as cocked eyes, wall eyes or external *strabismus*, are termed exotropias. The type of squint in which one eye or the other deviates upward or downward is termed hypertropia or hypotropia.

A nonmanifest squint, which technically speaking is termed phoria, differs from the manifest type of squint only in the fact that it is not manifest. There is the same tendency in a phoria as in a manifest squint or

tropia for the eyes to deviate from parallelism, but the patient is able, by voluntary effort, to keep the visual axes parallel. Esophoria, exophoria, hyperphoria and hypophoria have the same meanings as the corresponding terms esotropia, exotropia, hypertropia and hypotropia have in manifest squints.

Many adults, and even many children, present themselves to the ophthalmologist with eyes which have become permanently squinted because of neglect. Squints of this kind are often extremely difficult to correct because permanent changes have taken place in the muscles of the deviating eye, such as contractures, hypertrophies, and even permanent fixation. Moreover, eyes which have squinted too long are likely to develop what is known as anomalous correspondence, which simply means that the retinas do not receive visual impressions on corresponding points. A false macula may develop from anomalous correspondence.

THE RESPONSIBILITY FOR NEGLECTED SQUINTS

You have already heard Dr. Gailey emphasize the ignorance and misunderstanding which surrounds the whole subject of squint. I want merely to corroborate what he says. The parents of a child with a squint, or, for that matter, adult patients, most often present themselves to the ophthalmologist because of the cosmetic defect. There is a general failure to realize a most important physiologic fact, that, with few exceptions the squinting eye is also defective in vision.

For this ignorance, as Dr. Gailey has pointed out, the medical profession is largely to blame. Far more often than is pleasant to remember the general practitioner or the pediatrician is not aware of the importance of early treatment of squint and recommends postponement of treatment, or even of consultation with an ophthalmologist, until the child is of school age. Ophthalmologists themselves are not free from blame. If the ophthalmologist consulted is not capable of handling the case, he should refer the child to someone who is. Most reprehensible is the postponement of treatment on the ground that the child will out-

grow the condition. Occasionally he may, but such rare instances do not justify the giving of poor advice.

Recently what is termed psychosomatic medicine has received a great deal of attention, as it should, for in the treatment of many patients it is extremely important. The ophthalmologist must bear it in mind just as well as other physicians. He is treating the eye, it is true, but he is also treating the patient, and many times he is also treating the parents.

CAUSES OF SQUINT

Most squints are the result of faulty function of the muscles which move the eye to the right or to the left. They may also be caused by dysfunction of other muscles which move the eye up and down and in other directions, but the usual squint is the result of dysfunction of the muscles which act horizontally. These muscles, in contradistinction to other ocular muscles, have a single function, to move the eyes to the right or to the left. When their function is disturbed, horizontal squint occurs.

Muscular dysfunction is the basic cause of squint. Eyes deviate, however, or have a tendency to deviate, from parallelism for a number of different causes. The muscle itself may be weak congenitally, or weak because of abnormal postural tone. The same condition may be the result of illness, general weakness, various kinds of anemia, nervous debilities, and similar causes. In such cases, when the patient is in good health no trouble is likely to be experienced, but when the health is below par, the ocular deviation becomes manifest. The child who presents periodic squints belongs in this category; the parents, upon inquiry, will usually state that the abnormality is never noticed unless the child is tired, nervous or otherwise upset.

A second cause of squint is faulty anatomic arrangement of the ocular muscles, or abnormal configuration of the orbits. Faulty innervation of the muscles may also be responsible. Errors of refraction underlie other cases. Often the beginning of a squint can be traced to foci of infection,

a serious illness, a nervous shock such as would be produced by a fall from bed, or some similar specific cause.

AMBLYOPIA

Every movement of the eyes is controlled by one or more of the six muscles in each eye, or of the twelve muscles in both eyes. The coordinated action of these twelve muscles makes it possible for the image of an object to be placed on corresponding portions of the retinas of the two eyes. If there be any deviation from exact correspondence, the individual is immediately conscious of double vision. This can readily be demonstrated. If pressure is so applied to the eye as to move the visual axis from side to side, two objects will be perceived and diplopia will result. This is a state of affairs which the brain will not tolerate however, and what is known as suppressed vision of one object or the other takes place. As vision is repeatedly suppressed, suppression becomes chronic and what is known as amblyopia ex anopsia develops. Chronic suppression, as will be pointed out later, is important in the non-surgical treatment of squint.

Amblyopia merely means diminished vision. It is, however, of two types, true amblyopia and the type just mentioned, which develops as the result of suppression of vision. In the child, just as in the adult, double vision develops when a squint appears; the brain will not tolerate double vision; the image received by the brain from the corresponding point of the retina and the macula in the squinting eye is suppressed, and single vision is retained. Patients prefer single vision and they cannot obtain it from a squinting eye. The macular impression is therefore suppressed and the patient has single vision with the nondeviated eye.

True amblyopia responds poorly to any type of treatment or does not respond at all. The suppressive variety, on the other hand, responds relatively rapidly to patching, atropinization or amblyoscopic training. This is what might be expected. True amblyopia is the result of degeneration of cells in the geniculate body because of lack

of stimulation of the cells in that area over a long period of time by impressions received by the true macula. In the suppressive type of amblyopia the visual impressions reach their final destination through normal subcortical areas and it will respond well to exercises if the patient is seen early enough. Early training, however, is most essential.

PATCHING

The treatment of amblyopia is one of the first, and probably one of the most important, steps in the nonsurgical treatment of squint. In a very young child, whose squint is not of the alternating type, the use of atropine in the nondeviating eye often converts a non-alternating squint into the alternating type. In the great majority of cases an alternating squint is not associated with a marked reduction of vision in either eye. In an older child with a squint of the non-alternating type and reduced vision in one eye, patching is the treatment of choice to improve the vision in the poorer eye.

The use of patching is not as simple as it might seem. Ophthalmologists differ widely in their use of this method, which is unfortunate. Methods should differ, it is true, but not from ophthalmologist to ophthalmologist. They should differ from patient to patient, the method and the duration of treatment being varied to suit the individual patient, his individual characteristics, and, frequently, the family circumstances. Relevant family circumstances include not only the intelligence of the parents but the economic status of the family, the number of children, and their interest in all their children as well as their interest in the child with the squint.

In the usual case patching is probably best carried out by total occlusion of the nonsquinting eye with the ordinary type of eye patch secured by an adequate amount of adhesive tape. To be successful, it should be a twenty-four hour procedure, though this is often impossible, particularly at the start of treatment with some children. Often it is necessary to begin treatment with occlusion only for a short period each

day, particularly in a child with marked reduction in vision in the squinting eye. The younger the child, the more vigorously and more actively may treatment be instituted. On the other hand, it is unfortunate that the great majority of children with squints are not seen until they are in the preschool or early school age. At this time patching is not practical from the standpoint of safety in play and at school; it is bitterly resented by the child, and if it is begun later than the first grade, it is likely to affect the school work.

If the child and his parents have co-operated reasonably well, there should be considerable increase in vision at the end of thirty to forty-five days after the beginning of treatment. If improvement of this degree has not occurred by this time, further patching is unlikely to be of value, though again the duration of treatment must depend upon the circumstances of the individual case. The method must be used with common sense and must be discontinued if it seems to be harming the child's personality. To my mind, it is better to have a child with amblyopia who is normally developed emotionally than to have a less serious reduction in vision in a child with many severe fixed complexes resulting from prolonged, rigidly enforced occlusion of the good eye.

Another consideration in determining the length of treatment should be the co-operation of the child. The degree to which some children go to avoid occlusion of the good eye is remarkable. They will peep over occluders placed on their glasses. They will remove a portion of an occluding dressing and peep through the hole they have made. These and other things they will do with no detection from the parents. I remember in my own practice a five-year-old boy who vigorously resisted patching for a long time. Then, according to his parents, he suddenly became tolerant of the occlusion. Examination showed why: He had discovered that he could remove the patch, make a small hole in the center, replace it, see all he wanted to see, and yet remain in the good graces of his parents.

In cases of this sort, if there has not been appreciable or rapid improvement in vision, it is useless to continue occlusion.

THE CORRECTION OF REFRACTIVE ERRORS

In external squints which are the result of nearsightedness, the correction of the refractive error, which stimulates convergence, is, of course indicated. Otherwise, in my opinion, the treatment of squints of this origin is entirely surgical, with one exception: If unilateral amblyopia should be present, patching and some type of exercise may convert a unilateral squint into an alternating external squint, the correction of which is more likely to produce fusion and binocular single vision. It must be admitted that after the proper surgical correction of external squints, the tendency to squint may still exist. In such cases, exercises which stimulate the converging power of the eye will serve to decrease this tendency.

Correction of the refractive error is also a most important point in the treatment of internal squint which is the result of refractive error. I cannot, however, agree with those who advocate what is termed "ample atropinization" before refraction, meaning instillation of atropine solution of appropriate strength into the eyes for three or four days before the examination. The continuous use of atropine for three or four days is attended with a certain amount of risk, which is not justified. My own experience is that paralysis of the ciliary muscle entirely sufficient for refraction can be secured with the weaker cycloplegic homatropine.

The reason why internal squints are so frequently observed in far-sighted patients is because of the relationship between the ability to converge the eye and to accommodate the strength of one's own lens. Whether the degree of farsightedness is large or small, it is necessary for the lens to be increased in strength by the ciliary muscle if clear vision is to be maintained. If, for instance, the eye is farsighted to the extent of 5 diopters, then, in order to maintain clear vision for distance, that eye must ac-

commodate 5 diopters. With that degree of accommodation, there is an associated tendency for the eye to move inward or converge 5 meter angles. If the individual with this degree of disability desires to see at 10 inches, there must be an additional effort of accommodation to see clearly at that distance. The 4 additional diopters of accommodation required to see at this distance, instead of a normal convergence of 4 meter angles, requires a convergence of 9 meter angles. Since there is a greater physiologic desire for clear vision than for binocular vision, the farsighted individual naturally chooses clear vision. The result is clear vision in one eye, with diplopia. But since diplopia is intolerable, suppression results, followed by the development of amblyopia of some degree, and one or the other of the eyes turns inward because of the increased convergence impulses.

If glasses are properly fitted to the individual described, so that he sees clearly without the extra degree of accommodation otherwise necessary to correct his farsightedness, then normal convergence results, or should result. Squint can thus be corrected in a certain number of cases. If, however, properly fitted glasses have not produced an appreciable improvement in the internal squint within a period of one to three months, surgery is definitely indicated.

It should be emphasized that when a farsighted person with internal squint is fitted with glasses, it is almost impossible to provide him with sufficient lens power to correct the farsightedness both entirely and immediately. It is always wise, therefore, to give him as much farsighted (plus) correction as will be tolerated with comfort, while at the same time instructing the optician to furnish very thick lenses, so that, as increasing strengths of plus lens can be tolerated, the lens may be resurfaced and the patient put to a minimum of expense. If a residual squint results after the farsightedness is fully corrected, the case becomes surgical and the proper amount of surgical correction should be made.

THE MANAGEMENT OF INTERNAL SQUINTS NOT CAUSED BY REFRACTIVE ERROR

Internal squints such as strabismus fixus or traction syndromes, which are the result of structural changes in the muscles, are purely surgical so far as therapy is concerned. Non-accommodative esotropias are also almost always surgical, though many of these cases can be helped by orthoptic exercises. These exercises, however, should not be used longer than one to three months. If no benefit is apparent at the end of this time, surgery is indicated.

Innervational types of squints are almost all the result of systemic disorders, and for their correction the ophthalmologist must call upon the pediatrician, the internist and the psychiatrist. Squints which are the result of abnormal insertions of the muscles are almost always the result of over-correction or under-correction by surgery. The treatment is again surgical, the employment of some procedure to correct the original procedure.

Although the treatment of vertical deviations is no part of this presentation, it should be added that in the many cases in which, following expert surgery, a small degree of residual vertical deviation remains, correction is easily accomplished by the use of prisms base up or base down.

ORTHOPTIC TRAINING

Orthoptics is not a new branch of ophthalmology. It has been the source of many disputes among ophthalmologists, many of whom still doubt its usefulness. It has its place, however, in the nonsurgical treatment of squint.

An orthoptic diagnosis includes the various tests for binocular vision, the determination of the grades of binocular vision, retinal correspondence, and the angle and type of deviation as well as certain other factors which might prevent parallelism. All orthoptic treatment is based on forcing the patient to appreciate diplopia or double vision, which means that the true macula is being used. Many patients, with training, do come to appreciate diplopia, but not many pass beyond that stage. What then is best to do? Under these circumstances

it is far better to parallel the visual axes by surgery than it is to stimulate the macula to such an extent that permanent diplopia may result.

At the present time many ingeniously contrived devices are being marketed for the correction of squints without surgery. They are advertised for orthoptic training. It must be granted that such machines, which are really nothing more than major amblyoscopes, are helpful in diagnosis, and in some instances are useful in developing the faculty of fusion. On the other hand, a word of caution concerning their use is necessary. All too often, in the hands of ophthalmologists who are something less than expert, these machines are used day after day, sometimes month after month, and sometimes year after year, to exploit the patient for the sake of the fee.

Let me quote from a personal communication from a prominent teacher, with whose opinion I heartily agree:

I feel that from a practical standpoint, the use of orthoptics in the treatment of squint is mainly in the field of diagnosis of fusion and anomalous retinal correspondence. The theory of developing fusion is good, but a lot more research work will have to be done before it can be generally accepted as a practical routine for the treatment of squint.

This is a warning which might well be needed. Moreover, I am quite sure that certain types of vertical deviations in which these major amblyoscopes are used to exercise the eyes in a rotary manner are not only not improved but are likely to be made considerably worse.

SUMMARY AND CONCLUSIONS

1. The most important consideration in the treatment of squint, regardless of the type, is that the patient should be seen promptly.
2. Repeated measurements should be made with prisms, the vision should be checked frequently and carefully, and refraction of the eyes should also be carried out frequently.
3. Amblyopia may be treated by any

method productive of good results, but whatever method is adopted should be used cautiously and the results should be interpreted intelligently. Both the type of child and the type of family should be taken into consideration before any method of treatment is employed.

4. If exercises and orthoptic training do not produce parallelism of the visual axes, surgical intervention at the proper time is to be recommended. A trial of both measures is, however, necessary before operation is done.

5. If after operation there is a tendency for the squint to recur, exercises are useful, particularly in the external type of squint.

6. Patching or any desired type of visual training should also be continued following surgery if the indications exist.

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THE CROSSEYED CHILD—A SOCIAL AS WELL AS A MEDICAL PROBLEM*

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The squinting child presents serious social problems for the ophthalmologist to solve. The first of them, however, concerns the parents rather than the child.

THE PROBLEM OF THE PARENTS

The parents of a squinting child practically always need to be educated concerning all the aspects of squint. They usually present themselves to the ophthalmologist with a wealth of misinformation. They are deeply concerned with the cause of the squint, which they endeavor to trace to some accident, such as a fall, or some illness, such as measles, mumps or chickenpox. The cosmetic aspects of the abnormality concern them far more than the establishment of normal vision in each eye. They are not too greatly interested in having the child fitted with glasses, even if they are found necessary. They sometimes, on the other hand, anticipate complete recovery

from the wearing of glasses. Their concern is with appearance rather than with functional results. They harbor many false ideas about the surgery of squint. Some of them have been told that surgery involves something akin to enucleation, or that the eye must be fastened out on the cheek, or even that sight will be destroyed by operation. Some of them believe that if the eye is straightened, it will deviate in the opposite direction from its original position a few years after the operation; the generation of grandparents could scarcely be blamed for this fear, for it happened many times in the days when tenotomy was being done.

The most serious misconceptions which the parents of the squinting child entertain are, however, not those which I have already mentioned, but two others. The first is that unless the squint is quite pronounced and is recognizable at a considerable distance, they completely fail to realize that the psychologic problem is actually or potentially greater than the ophthalmologic problem. The second is their belief that a child with a squint should not be taken to an ophthalmologist until he reaches school age.

The first duty of the ophthalmologist, therefore, when he is consulted concerning a child with squint is to see to it that the misinformation and the erroneous concepts entertained by the parents and the grandparents are dissipated. This is not difficult, though it takes a little time and effort. They should be informed that in the great majority of cases no definite cause for a squint can be discovered. Then they should receive a lesson in anatomy, not a detailed lesson, but a simple explanation of the anatomy of the muscles of the eye. It should be particularly emphasized that the ocular muscles are inserted on the exterior of the globe, that their chief function has to do with movements of the eye, and that they have nothing to do with the internal structures of the eye, or with the sight of the eye. Finally, the parents should be informed that ocular surgery is almost painless, that the approach to it is purely scientific, that it is based on measurements and

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not on guesswork, and that it will in no way damage the sight.

THE PROBLEM OF THE CHILD

The first concern of the child with squint is his appearance. He knows that he differs from his playmates in that his eyes are not parallel. He realizes his predicament, as a rule, far better than his parents realize it. He has good reason to realize it. Children, unfortunately, are cruel little animals. They take special delight in taunting their playmates and acquaintances about their physical defects. The child with a squint is likely to be the object of more derision than the spastic child.

Adults, I am inclined to believe, are fully as bad as children in this respect, and not so honest about it. The adult does not shout his taunt, as do children. The adult simply whispers—often loud enough to be heard—or points, or stares, or otherwise displays his curiosity as to the crosseyed child. This sort of thing is extremely hard for a child to bear. As I look back upon my own youth, a picture comes to mind of a big lout of a boy, neither handsome or ugly, with many big, dangling hands and feet, a boy who was extremely self-conscious, though he really had nothing to be ashamed of. And it occurs to me that if I had had crossed eyes to bear, in addition to my other difficulties at that age, I might have developed an inferiority complex from which I might never have recovered.

The child with a squint has his own ways of concealing his abnormality. He may hold his head to one side or the other. He may affect a tilted position for his head. He may keep his eyes cast down. He may avoid looking people directly in the eyes.

If the child has been called crosseyed or cockeyed or wall-eyed, he almost invariably begins to withdraw from social contacts and personality problems begin to make their appearance. This is true of almost all children, and particularly of the very sensitive child. If the parents are questioned about the child's health and behavior, they are likely to report capriciousness in eating, restless sleeping, lack of group participation, and acute nervous-

ness. Sometimes the child disguises his ocular defect by extreme activity and even blatant exhibitionism, in an unconscious endeavor to draw the observer's attention away from the crossed eyes which are at the bottom of all his complexes. If he happens to belong to the very aggressive group of children, he may demonstrate his abilities to his comrades in other ways, often becoming destructive and actually incorrigible. He is a behavior problem in the home and at school, and often requires referral to, and complete testing in a child guidance clinic.

Crosseyed children frequently do bad work in school and do not pass their courses. If they are referred for psychology investigation, it will be found that they often have average and better than average intelligence. Some of them are superior. Some of these children fabricate all sorts of excuses to remain out of school, because of the teasing to which they have been subjected. When they are forced to attend, their reaction—a blind desire to get even with all concerned—suggests the tactics of a sit-down striker. Many of these children, when their defects have been corrected surgically, seem totally different. Their nervousness disappears, they eat and sleep well, they identify themselves with their school groups, they do well in classes, and their behavior even approaches the normal, if there is such a thing as normal.

THE PROBLEM OF THE ADULT WITH SQUINT

The adult with a squint also is surrounded with difficulties. Many such persons, though well qualified from the standpoint of education and experience and even trained for skilled professions, are kept out of large industrial concerns because vision in one eye is so low that the risk of employing them would be too great. The industries cannot be blamed. Insurance companies refuse to issue liability insurance to firms which employ such handicapped persons. Regardless of the reason, the situation adds nothing to the self-confidence or self-respect of the adult with a squint. Many adults with squint have had the type of unhappy childhood I have described.

They confess that their entire youth was an ordeal of self-consciousness, in which they refused to participate in social activities for fear of ridicule. Many of them harbor an intense resentment against their parents, and a considerable number resent the part played in the persistence of their defects into adult life by poorly informed doctors, pediatricians and oculists.

If these adults had been treated when they were children, they could have been given amblyopic therapy, fitted with proper corrective lenses, or been subjected to surgery, and would have been spared many agonizing days. I have operated on several adults with squint who themselves earned enough money to enable the correction to be made after they had control of their own destinies. It is a gratifying thing to be able to correct a disfiguring squint in a young man or young woman in whom it has been a psychic as well as a physical disability.

THERAPY

The relief of psychic suffering among crosseyed children is a perfectly simple matter. It merely involves correction of the squint by whatever means are indicated as early in life as possible. Whenever possible, the cure should be functional as well as cosmetic before the child reaches school age.

Most children are apprehensive at the time of their first visit to the ophthalmologist, but a good working relationship is not difficult to establish. Often the child understands the problem and proves more co-operative than the parents. If the entire problem is explained to the child on his level, and if examination and treatment are carried out with his cooperation, there will be few difficulties. Letting the child participate in the procedures is often the solution of the problem, even if he does nothing more than hold the fixation target.

DISSEMINATION OF INFORMATION

The management of the child with squint is thus fairly simple. I am afraid, however, that a good deal more education is necessary among the parents of these afflicted children. They have been miserably misinformed as to how and when these children should be treated, and as to what sort of

medical, optical and surgical treatment they should have. Much of the responsibility for the unintelligent advice the parents receive must be laid at the door of the general practitioner, the pediatrician, and, I am sorry to say, the untrained ophthalmologist.

I hope my listeners will forgive me if I speak quite bluntly about this matter. I have never, I believe, had the effrontery to advise parents what to do about Willie's feeding problems or his broken bones, or little Harold's hernia. If I am asked about such matters, I refer them to the family doctor or the pediatrician. I do not feel myself competent to give expert advice in such cases. Pediatricians and family doctors should refrain from advice about eye conditions and refer the patients promptly to an ophthalmologist.

I rather suspect, however, that most if not all of the confusion in the management of crosseyed children is really the responsibility of the ophthalmologist, because he has failed to inform the parents, as he might readily inform them, of certain fundamental considerations, as follows:

- 1) There is not one spontaneous cure of squint in every hundred cases.
- 2) The child with a squint should be taken to a competent ophthalmologist, regardless of his age, as soon as the slightest deviation from parallelism is detected.
- 3) All children with squint do not require surgery. There are nonsurgical measures for correcting the defect, though they are not applicable in every case.
- 4) If surgery should be necessary, it is not hazardous to life or to sight.

SUMMARY

The psychic problems of children with squint are even more important than the ocular problems, which are readily managed by nonsurgical or surgical measures. Parents need education as to this condition. Ophthalmologists should make themselves responsible for the dissemination of correct information about this defect, the most important consideration being that the child should be taken to a competent ophthalmologist as soon as the slightest deviation from parallelism is detected.

THE ROLE OF RETROBULBAR NEURITIS IN THE MANAGEMENT OF SENILE CATARACTS*

SHELLEY R. GAINES, M. D.

NEW ORLEANS

With perfection of the intracapsular technic of cataract operation there has been a trend toward early operation in patients who are unable to read.

Before operating on these patients, the surgeon must be sure that the lens opacity is the cause of their decreased vision. The examining physician is apt to be misled as to the part the lens opacity is playing in obstructing vision if he depends too much on the slit lamp appearance of the cataract. All of us have seen, with the slit lamp, marked cataract formation, especially in certain congenital lens changes where the patient reads 20/20 and is not incapacitated. On the other hand, it is a common thing to observe old people with no lens changes whose vision is markedly decreased. The visual loss in many of these individuals is due to chronic retrobulbar neuritis, undoubtedly of arteriosclerotic origin.

When the cataract patient's fundus is examined with the ophthalmoscope the surgeon should automatically compare the patient's ability to see out of the eye with the examiner's ability to see into the eye. If the patient's vision is poor, but good fundus detail can be observed, other causes than cataract must account for the patient's visual symptoms.

We are particularly interested at this time in the fact that arteriosclerotic retrobulbar neuritis is present in many of these patients. Interest in arteriosclerotic cavernous atrophy has been stimulated by the studies on so-called soft glaucoma with attention centered on those cases that show cupping of the optic disc.

A. Knapp^{1, 2} reports certain cases of optic atrophy with cupping and low tension where sclerosis of the basal vessels was

demonstrated by x-ray pictures. He thought that pressure of the sclerotic internal carotid vessels on the optic pathways might be a factor in producing the optic atrophy.

John McLean³ reports a case of optic atrophy with cupping of the optic discs. The chiasm was explored by a neurosurgeon and sclerotic plaques were found in the internal carotid artery that pounded the optic nerves at every pulse beat. This constant trauma was thought to be a factor in bringing on the optic atrophy.

Lyle⁴ presents a case in which the visual fields showed binasal hemianopsia. At autopsy the right internal carotid artery had notched the junction of the chiasm and optic nerve on its side. Lyle concludes that the pressure of the sclerotic vessels caused the field defects and the optic atrophy.

Traquair⁵ states that pressure of sclerotic internal carotids might explain binasal hemianopsia.

Dandy⁶ observes that sclerotic internal carotid arteries were quite often found in contact with optic nerves when the patient had no visual field loss. He concludes that pressure from sclerotic vessels is therefore not a cause of optic atrophy.

Walsh⁷ states that although the etiology of soft glaucoma remains undetermined, arteriosclerosis of the cerebral vessels seems to play a part in its production.

Not all patients with arteriosclerotic optic atrophy, especially early cases, show cupping of the disc or necessarily very much pallor of the nerve head. F. Rintelen⁸ believes that arteriosclerotic optic atrophy is more common in old people than is realized. He made a pathological study of 48 nerves from old individuals. His findings were: Scarred areas and rarely hemorrhagic infarcts caused by total or partial obliteration of small vessels; the necrotic foci thus caused were followed by glial or mesodermal scarring.

Arnold Lowenstein⁹ studied histologically 6 eyes with profound vascular changes, most of which had been removed because of venous thrombosis. He found necrotic and cavernous patches constantly present

*Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April 14, 1948.

in the nerves, situated some distance from the lamina cribrosa. He concluded that the degenerative changes were secondary to vascular disease and impairment of nutrition.

Duke-Elder¹⁰ states that in arteriosclerotic optic atrophy degeneration may be diffuse or patchy. Clinically, the examiner finds generalized depression of the field, sector defects, or central scotoma.

Patients with lens opacities not dense enough to explain their loss of vision deserve careful visual field studies both with the perimeter and the tangent screen.

Our findings concur with those of Duke-Elder¹⁰ briefly quoted above. We have not found cases manifesting binasal hemianopsia. Visual loss has varied from 20/25 to 20/400. Ophthalmoscopic findings have not as a rule been dramatic. The optic discs are usually quite normal unless vision is greatly reduced, in which case pallor becomes manifest.

A patient with lens opacities and arteriosclerotic atrophy should be treated conservatively as long as it is possible to do so. When the cataract develops to such density that removal is indicated, the patient should be warned that even though his cataract operation restores peripheral vision, he may not be able to read because of the already existing disease of the optic nerve that has destroyed central vision.

CASE REPORTS

Two typical cases are reported:

Case No. 1. Mr. D. E. S., age 65, was seen on February 24, 1947. He complained of difficulty in reading. His best correctable vision was, right eye 20/70, and left eye 20/30. Definite posterior subcapsular lens changes together with cortical spokes were present in both eyes, more in the right than in the left eye. Intraocular tension was 18 millimeters of mercury with the Schiotz tonometer, right and left. The fundus could be seen in both eyes without much difficulty. The disc appeared normal; moderate arteriosclerotic changes were present. Physical examination and neurological examinations were negative except for evidences of arteriosclerosis in the larger vessels. Visual fields showed a concentric contracture of about

10 to 15 degrees (3/330 white). The 1/1000 white isopters were definitely contracted. Central scotomas were present in both eyes. When last seen on February 18, 1948, all findings were about the same including refraction and fields. Vision was correctable to 20/70 in the right eye and 20/30 in the left eye.

Case No. 2. Mrs. C. P. C., age 72, was told by an oculist she had cataracts. She complained of difficulty in reading and on her first visit brought five pair of glasses that had been changed from time to time in the last five years with no improvement in her ability to see small print. Her best correctable vision was 20/40 in each eye. The intraocular tension was 18 millimeters of mercury with the Schiotz, in both eyes. On slit lamp examination nuclear sclerosis and cortical cataracts were found in each eye. The fundus could easily be seen in either eye. Marked choroidal sclerosis was present; there were early arteriovenous crossing changes, no pallor or cupping of the optic disc could be seen. Visual field studies showed a definite central scotoma in each eye plus concentric contracture of the 3/330 white about 10 degrees from normal. One year later the fundus findings were the same and her best correctable vision was 20/30 in each eye.

CONCLUSION

Arteriosclerotic optic atrophy is the cause of failing vision in many people who have early cataracts.

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CONGENITAL EYE MUSCLE ANOMALIES*

(RETRACTION SYNDROME AND CONVERGENCE INSUFFICIENCY)

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NED W. HOLLAND, M. D.†

NEW ORLEANS

Ocular deviations due to extra-ocular muscle anomalies are becoming an ever increasing problem to the ophthalmologist. The deviation may be so slight that it can be overcome by the desire for fusion, or may be so great that the defect is obvious. In either case the proper examination will determine the course of treatment.

The cases presented in this paper will aid in the diagnosis, and are the most common congenital defects seen. They are of a retraction syndrome and a convergence insufficiency that were present since birth. The case of convergence insufficiency appeared to become progressively worse as the child became older.

CASE NO. 1

A fourteen year old colored male was seen in the clinic in June 1947. His chief complaint was that his eyes turned out. *Present illness:* His mother had noted an abnormal turning out of one or both eyes since birth, the condition becoming more pronounced within the past six to eight years. There were no other subjective symptoms. *Past history:* The child was a full term forceps delivery. *Family history and review of systems* were irrelevant.

Physical examination of the patient other than the abnormality of the eyes was essentially negative. Vision was recorded as 20/40 for the right eye and 20/30 for the left eye. Externally the eyes presented a definite exotropia with an alternating type of fixation. Screen test (see figure 1) presented, in addition to the exotropia, a bilateral elevator paresis. Screening in the six cardinal posi-

tions of gaze revealed an exotropia of 45 prism diopters with a right hyperphoria of 4 prism diopters at 6 meters, and at 25 centimeters an

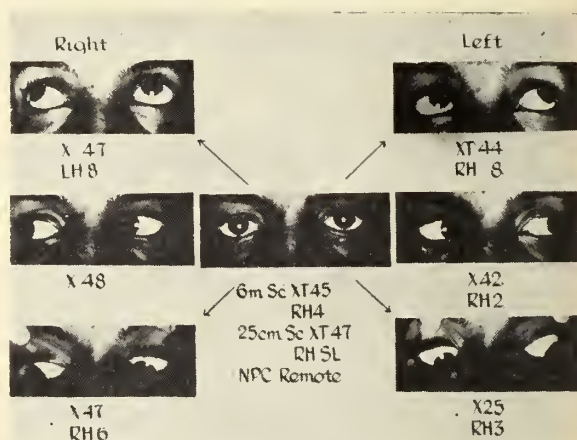


Fig. 1.

exotropia of 45 prism diopters with a right hyperphoria slight. In the positions of gaze a concomitant squint of between 44 to 48 prism diopters of exotropia was found, with a right and left hyperphoria of 8 prism diopters in the upper fields. The near point of convergence was remote. Diplopia fields were negative. The internal examination of the eye revealed no pathology. Retinoscopic under full atropine cycloplegic revealed an error in both eyes of 0.75 diopters after correction was made and checked by cycloplegic acceptance.

The patient was admitted to the hospital and under ether anesthesia both medial recti muscles were resected four millimeters. Following an uneventful recovery the patient was referred back to the clinic and subsequent examinations revealed a noticeable improvement. At the present time the screen tests (see figure 2) reveal an alternat-

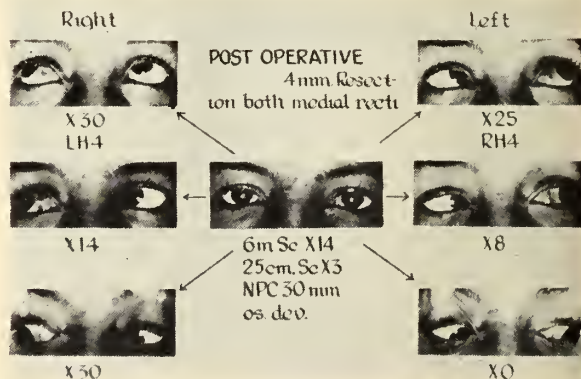


Fig. 2.

ing type of fixation and less exophoria. The near point of convergence has been reduced to 30 millimeters with the left eye deviating. The screen

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findings at six meters were exophoria of 14 prism diopters and at 25 centimeters the exophoria was 3 prism diopters. Exophoria in the positions of gaze has been correspondingly reduced. The patient now presents an imbalance of the eye muscles of a moderate degree and has been greatly helped by surgical procedure.

CASE NO. 2

An eleven year old colored male was first seen in July 1947. The chief complaint was that "my right eye turns out". *Present illness*: It was learned that the patient had not been able to adduct the right eye since birth. There were no subjective symptoms and the past history, family history, and review of systems were irrelevant.

Physical examination of the patient other than the abnormality of the eyes was negative. Vision was recorded as 20/30 in the right eye and 20/20 in the left eye. Externally the right eye was seen to be turned out (see figure 3). When an attempt

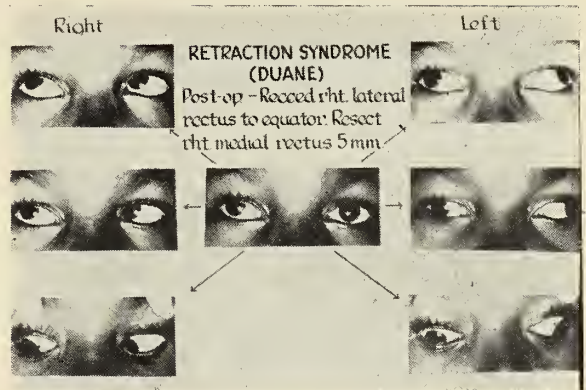


Fig. 4.

Eight weeks later again under ether anesthesia the external rectus of the right eye was receded sixteen millimeters to the equator of the limbus. At the present time, now four weeks since the last operation, there are only slight cosmetic results. The patient is unable to bring the eye to the midline and there is less abduction. All other symptoms of the retraction syndrome are present.

In contrast to the first patient the second presents a muscle imbalance of a more severe degree and one more difficult to correct. The latter case has not been surgically corrected by two operations, and the cosmetic results are not satisfactory.

DISCUSSION

For the purpose of discussion it will be better to divide the causes of squint or strabismus into three main groups: (1) Deformities of the extra-ocular muscles. (2) Deformities of innervation of the extra-ocular muscles. (3) Errors of refraction.

The muscles that are concerned with the movement of the eyes are six in number and are divided into four recti and two obliques. These muscles act on the eyeball in the following manner: (a) Elevators are superior rectus and inferior oblique; (b) depressors are the inferior rectus and the superior oblique; (c) horizontal movements are by the medial rectus which adducts the eye, and the lateral rectus which abducts the eye.

One can now study the defects in the muscles which are congenital in origin. The most common defects are the varying degrees of fibrosis of the muscle and its abnormal insertion to the eyeball. Two of the most common defects of fibrosis occur with such frequency that they have been

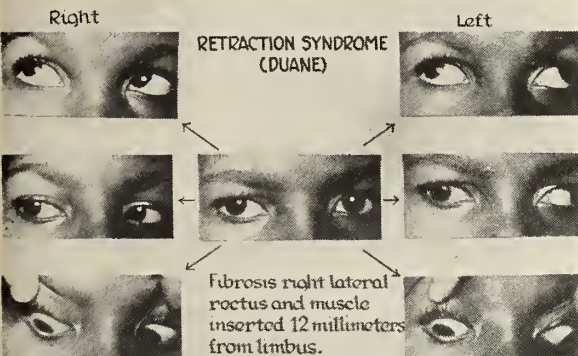


Fig. 3.

was made to look to the left, the right eye would move only to the midline. However at this time a retraction of the eye, narrowing of the palpebral fissure, and an upshoot was seen to occur. On looking to the right there was an overshoot of the medial rectus of the left eye. Internal examination of the eyes was negative for abnormal pathology.

A diagnosis of retraction syndrome was made and it was thought advisable that the lateral rectus of the right eye be explored. Under ether anesthesia both the lateral and medial recti were examined, the medial was found to be normal in appearance whereas the lateral was found to be thick and fibrotic and inserted 12 millimeters from the limbus. At this time the medial was resected four millimeters and a central tenotomy of the lateral rectus was performed. The patient made an uneventful recovery and subsequent examinations revealed no beneficial results (see figure 4).

classified as a syndrome. The first, referred to as Duane's syndrome or the retraction syndrome, is one in which either the medial or lateral rectus is fibrosed in varying degrees. This results in the following findings: (1) Decreased movement in the action of fibrosed muscle. (2) Retraction of eyeball in direction of action of normal muscle. (3) Limitation in action in direction of action of the normal muscle. (4) Narrowing of palpebral fissure in field of normal muscle. (5) Eye shoots up or down in field of action of normal muscle. (6) Poor near point of convergence.

The second least common condition is known as strabismus fixus and is due to fibrosis of the medial rectus, in which case the eye is fixed in, at the inner canthus, and it never moves out from this position. The fibrosis is so great that the danger of surgery on these cases is the rupture of the eyeball on attempt at removal of the muscle.

There are many other defects of abnormal attachment of the muscle to the eye and degrees of fibrosis other than the case presented, which is a Duane's or retraction syndrome, in which measurement of the insertion of the lateral rectus revealed it was 12 millimeters from the limbus instead of the usual 6.9 millimeters. This case is also very unusual as it presented a condition in that when the child looked in the field of the normal medial rectus the defective eye turned out instead of in. Upon operation a very large and fibrotic muscle of the lateral rectus was found which did not give when traction was put on the eyeball. It was considered advisable to do a central tenotomy leaving only very small bands to remain attached to the eyeball, with the desire to see if the resection of the medial would aid to stretch the fibrous connection. Since no results were obtained, the muscle was at a later stage resected to the equator and still the cosmetic results were not obtained. The final solution to the problem has as yet not been determined, but a complete tenotomy is indicated.

The second group of causes are the innervation defects. Any supranuclear les-

sions will affect the impulse to the nuclei and that will result in decreased impulses to the muscles. The nuclei of the nerves can be involved in diseases of the brain substance, particularly encephalitis, and the nerve can become involved in its passage through the meninges in meningitis and in the foramen in fractures of the base of the brain, and in disease processes of the bones such as Paget's. Finally, in the orbit any of the orbital diseases will involve the nerve. The most frequent nerve involvement is the abducens and it is frequently injured by trauma, especially in a blow to the side of the head as here it has the least protection.

The third and last group of causes of strabismus and the most important to the ophthalmologist are those which result from an error of refraction. These cases are first seen at about the third or fourth year of life at which time the child first begins to concentrate on close work, such as picture books. The parent will notice that the child's eye turns in only when there is an attraction close to the child and it may be one eye one time and the other eye the next time. In these cases there is usually a very great error of refraction and the error is one of hypermetropia. The mechanism behind this defect is the close association between accommodation and convergence and since the child cannot overcome the error he brings into play the extraocular muscles and this results in one eye turning in. If the condition persists over several years, the eye will remain in, or the child will alternate and the medial will become so strong that a condition of convergence excess occurs. Later the lateral muscles will become weakened by being unable to act against the medial thus the same case will be complicated by divergence insufficiency. This can all be prevented by a proper cycloplegic refraction and the prescribing of the full cycloplegic findings. Once the eye remains turned in for a long period, amblyopia will result.

Another refractive error condition which results in the eyes being turned out is seen in myopia, in which the medial muscles be-

come weak due to the lack of the accommodative power and a condition of convergence insufficiency results. If the lateral muscles continue to work over the weak medial muscles, a secondary complication of divergence excess occurs. The condition is usually seen in adults and is corrected by either prescribing convergence exercises or overcorrecting the myopia to stimulate convergence.

Other conditions which cause the eyes to deviate will not be discussed for they are numerous and time consuming. They are pathological and obstruct vision of one eye, as in cataracts, corneal scars, etc.

The minimal equipment used for examination of patients consists of a screen made from an old x-ray film, or folding of a prescription blank the long way, a small light for fixation, Maddox rod, red glass, vision chart, muscle light at 20 feet, and a set of square prisms plus the trial cases and retinoscope. The procedure consists of an essential history and a complete eye examination to rule out pathological conditions which cause defective vision. Following this, a screen test is done according to the technique presented by Dr. White and the errors in all the cardinal fields are neutralized by the use of square prisms. This includes both the horizontal and vertical defects and all is recorded. The near point of accommodation is made and recorded in millimeters. A screen Maddox rod test is made to determine the presence of retinal correspondence, whether normal or abnormal. Finally a cycloplegic refraction is made and a copy of the prescription that is worn is recorded.

Once all of the desired measurements have been made and compiled one can plan

the method of attack that will be used to correct the defect. If refractive measures are indicated, then glasses are prescribed and repeated tests are made to determine the remaining errors. Orthoptic measures may be indicated. These also are started and should surgery be indicated the amount of the surgery to be done and the muscle to be operated upon are figured prior to the time that the patient goes to surgery. Without expensive orthoptic machines one can obtain the desired effect by the use of a prism bar of Berens for convergence and divergent exercises.

The first case represents the more common type of strabismus seen and is a concomitant case of convergence insufficiency which was partially corrected by medial surgery. In this case the near point of convergence was distant and had to be brought in to obtain the desired results, consequently medial surgery was indicated.

In conclusion it can be said that the diagnosis of strabismus can be made with the minimum of equipment and treatment may be satisfactorily carried out. A proper diagnosis is essential to satisfactory results and only by the scientific approach may progress be made in the surgical correction of motor muscle anomalies.

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SPONTANEOUS PNEUMOTHORAX AND MEDIASTINAL EMPHYSEMA

The occurrence of spontaneous pneumothorax or mediastinal emphysema always brings acute concern. The patient is startled by pain and beset with fear; the physician has immediate occasion to consider the uncertainties of its course and the physical methods of relief. The two conditions are different in their clinical manifestations but related in development.

Spontaneous pneumothorax as a clinical entity has been known over an indefinite time. Methods of diagnosis now available have changed it from a rarity to a condi-

tion of comparative frequency. Schneider and Reissman reported an incidence of 1 in 500 of armed service selectees, age 18 to 33. Heath reported 10 cases in 28,000 admissions to A.A.F. Regional Hospital, Lincoln, Nebraska.

Concepts of the etiology of the condition have changed in the past twenty years. It was formerly accepted that the majority of cases were tuberculous in origin. Now it is felt that the incidence of tuberculosis is 10 per cent or less, and that its presence has little bearing on the development of the pneumothorax. Theories as to the mechanism of the production of the pneumothorax are several. The condition is rarely fatal and few necropsy reports are available. On the one hand, the thought is presented that an emphysematous bleb, or "valve vesicle," is so situated that air enters and cannot leave. Another projected cause is a rent in the visceral pleura due to the pull of adhesions. A third cause is the rupture into the pleura of congenital pulmonary cysts. It is probable that all three factors have a bearing on the problem, and with them is a fourth which is related to the occurrence of spontaneous mediastinal emphysema, and subsequently, to the production of spontaneous pneumothorax.

The existence of emphysema in the mediastinum has been known for more than a century as consequent upon trauma, or secondary to serious respiratory disease. In 1934, Hamman first called attention to the spontaneous occurrence of this condition. He described mediastinal emphysema as characterized by sudden pain in the chest, which possibly might radiate to the upper midback, shoulders, neck, and occasionally down the left arm. There may also be pain on deep breathing, swallowing, or movement of the head. The duration may be hours or several days. The character of the symptoms may lead to an erroneous diagnosis of coronary occlusion. The presence of air in the tissue of the anterior chest wall or neck is diagnostic. The pathognomonic sign is a peculiar crunching sound heard over the precordium and synchronous with the heart beat. This was attributed

by Hamman to the action by the heart on the air between the pericardium and the sternum. Roentgenographic demonstration of air in the mediastinum is also diagnostic. In the general diagnosis, coronary occlusion, pericarditis, dissecting aneurism, pleurisy, and pulmonary embolus must be considered.

In studying the condition of mediastinal emphysema, Hamman observed that in trauma to one side of the chest pneumothorax may occur on the opposite; that in children with pneumonia, mediastinal, and possibly, subcutaneous emphysema, often occurs; that subcutaneous emphysema and pneumothorax may occur in asthma. He advanced the opinion that air from spontaneously ruptured alveoli would travel along the interstitial bands to the mediastinum, and then to the thin parietal pleura and into the pleural cavity when a bleb ruptures.

Hamman pointed to experimental and clinical support of this theory. Macklin inflated the lungs of cats and produced interstitial emphysema, but no rents in the visceral pleura developed. Spontaneous pneumothorax occurred in 2 of Hamman's 7 cases of spontaneous mediastinal emphysema. Since these observations, others have reported numerous cases of the two conditions existing together.

Miller reported 4 cases of spontaneous mediastinal emphysema, and in 2 of these spontaneous pneumothorax was demonstrated. Schwartz *et al* reported 6 cases with the two conditions. Dickie reported 6 cases of spontaneous pneumothorax without mediastinal air, 7 individuals with mediastinal air and without pneumothorax, and 7 with a combination of the two conditions.

This conception of the production of pneumothorax explains the occasional in-

stances in which spontaneous pneumothorax on one side is followed within a few hours by the same condition on the other side.

Alternating spontaneous pneumothorax has been studied by Cooch, who collected reports of 44 cases and added 1 of his own. Cases under consideration were those in which pneumothorax occurred on different sides on one or more occasions a month or more apart. One case was found to have tuberculosis three years later and none of the remaining 44 was believed to have this disease at the time of the pneumothorax. The number of attacks of pneumothorax varied from two to twenty. The severity of attacks varied between cases and among different attacks in the same individual.

The variable picture immediately following the attack and the unpredictable course suggest that in those instances in which the rupture of a valve vesicle is peripheral, tamponade of the lung may result, and that in other cases in which the initial emphysema is interstitial and subsequently reaches the pleura by the mediastinal route, the retraction of the lung closes the interstitial ruptured alveolus before tension develops.

The treatment of this condition varies with the severity. The majority of patients should be in bed until the air begins to disappear, even though they are symptom free. The severe cases require aspiration of the air under tension. When this beneficial effect is only transitory, there should be air drainage. This is accomplished by fixing a needle or catheter in the chest wall communicating with the pleura, and attaching to it a rubber tube leading under water 3 feet below. An oxygen tent may be necessary. With such arrangements, severe bilateral cases can be supported successfully.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

AMA ASSESSMENT

At the Interim Meeting of the American Medical Association, recently held in St. Louis, considerable time was devoted to discussion of plans for future activity in regard to a unified fight against all bills and other threats which will result in compulsory health measures for the citizens of this country. It is felt by the leaders of organized medicine, as expressed by delegates to this meeting, that concentrated effort is needed in this fight and that there must be obtained the interest, cooperation and assistance of every physician in these United States. During the past several years there has been maintained in Washington an office, operated by representatives of the AMA, for the purpose of keeping in close contact with all matters of interest to the profession; giving support to appropriate congressional matters and offering immediate and powerful opposition to all phases of legislation which would be detrimental to the American public and would tend to take away from the medical profession freedom to treat their patients in the manner which they feel is most beneficial and adequate for them. This office has been a great asset in these endeavors, however due to the evident increased activity on the part of the present administration which, from all indications, quite highly favors federalization of the practice of medicine, it is the consensus of the Board of Trustees of the AMA that expansion of efforts of organized medicine is acutely needed at this time.

In line with such feeling it was agreed at this Interim Meeting that every member of the AMA is no doubt vitally interested in these plans and therefore desirous of participating in this fight. An undivided profession is the greatest asset for which we can hope at this crucial time and it is felt that all members who will give thought to this subject will agree with this principle.

The AMA has levied an assessment of \$25.00 on each member of the Association and has asked that the state medical societies assist in collection of this amount. In December the president of the Louisiana State Medical Society addressed a letter to every member of this Society in which he asked cooperation and support in this endeavor. In the same communication was included a notice from the secretary-treasurer requesting that payment be remitted to secretaries of the various component societies who would in turn transmit this to the office of the Society. Up to date there have been received checks from a good percentage of the members, however there are many more who should give this important subject their immediate attention. It is desired that Louisiana be outstanding in this combined fight against the hazard which is threatened. If the government assumes control of the practice of medicine it is felt that our country, our state, our city, and our parishes will be denied the maximum medical care which the individual physician is able to render and has rendered to the citizens of this nation. To take the practice of medicine away from the individual doctor will certainly not work to the advantage of the general public. The personal relationship between the doctor and patient, which is the solid foundation of medical practice, will be destroyed. There is nothing more satisfying to a patient, no matter what the physical condition, than to know that he enjoys the confidence and interest of his attending physician. All of the doctors in Louisiana are urged to send in their remittance for this assessment promptly in order that these objectives may be maintained. Do not object to the assessment—this is the first ever levied by the American Medical Association. If it is not paid it may be the last opportunity for contri-

bution—the government may take over and force a higher assessment on all citizens—including the physicians.

In addition to payment of the assessment, which is of paramount importance at this time, the following suggestions for activity in opposing federalization of medicine are offered by the president of the State Society

1. Talk to your patients, asking them to express their opposition in writing to their congressmen.

2. Talk to civic and business leaders whenever and wherever possible, getting them to do likewise.

3. Talk before, and in all other ways, in-

fluence clubs, unions, and other organizations to likewise protest.

4. Personally call upon your congressman or by letter express to him your opposition and the reasons therefor.

5. Support wholeheartedly your local, state, and national medical societies in their effort to combat such legislation. Funds will be needed which you should supply unhesitatingly, feeling that every dollar you can spare in the fight against such legislation will pay you and your children dividends for years to come.

Again, may it be emphasized that the cooperation and interest of every member of the Louisiana State Medical Society is needed and earnestly solicited.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

SECOND ANNUAL FOUNDER'S DAY FORUM OF THE RAPIDES PARISH AND EIGHTH DISTRICT MEDICAL SOCIETIES

Tribute to the physician and his life's work was paid by Bishop Charles P. Greco of Alexandria, Louisiana, in the principal address at the annual Founder's Day banquet of the Rapides Parish and Eighth District Medical Societies at Hotel Bentley, January 15, 1949.

The banquet climaxed the day-long Founder's Day Forum at which scientific papers were presented by eminent professors and physicians from Louisiana State University and Tulane Medical Schools, New Orleans, Louisiana. The speakers for the day were:

Julius W. Davenport, M. D.,
Willard R. Wirth, M.D.
Carl N. Wahl, M.D.
Curtis H. Tyrone, M.D.
W. R. Akenhead, M.D.
Samuel A. Romano, M.D.
E. Perry Thomas, M.D.

J. K. Howles, M.D.

A. Scott Hamilton, M.D.

Dr. Richard E. C. Miller was installed as president, succeeding Dr. James A. White. Other officers installed were: Dr. E. C. Uhrich, first vice-president; Dr. Morris J. Hair, second vice-president; Dr. Henry Q. Gahagan, secretary-treasurer and Dr. H. H. Hardy, delegate.

Dr. Charles O. Horton of Franklin, selected as the outstanding general practitioner for Louisiana and the third outstanding practitioner from the United States by the A.M.A., and Dr. M. D. Hargrove and Dr. P. T. Talbot, president and secretary-treasurer, respectively, of the Louisiana State Medical Society, were among speakers who addressed the gathering of more than 200 doctors, their wives and guests. Presenting Dr. Horton, Dr. King Rand of Alexandria spoke of him as a man who "has devoted his life to the medical care of his neighbors."

SECOND DISTRICT MEDICAL SOCIETY

The regular meeting of the Second District

Medical Society was held on January 20, Dr. Joel Gray, president, presiding.

Under the auspices of the Council of Medical Service and Public Relations, Dr. Marjorie Shearon of Washington, D. C., gave a talk on socialized medicine. She warned the members of the Society of the impending danger of the passage of legislation extending the social security act. A resolution opposing any form of national compulsory medical care insurance was passed unanimously by the Society and copies of the resolution were sent to the Senators and Representatives of Louisiana asking their co-operation in this matter.

ORLEANS CHAPTER OF THE AMERICAN ACADEMY OF GENERAL PRACTICE

The Orleans Chapter of the American Academy of General Practice held its regular monthly meeting on November 29, 1948, at the Lenfant's Boulevard Room. An excellent dinner was served to those attending.

Dr. H. S. Mayerson, Professor of Physiology at Tulane University, presented a very interesting talk on Physiology of Hypertension and on the functions and relation of the thyroid gland to the other endocrine glands. The presentation was followed by a round table discussion on hypertension and the newer methods of treatment of Graves' disease.

Several similar dinner meetings and round table discussions are planned for future meetings.

THE AMERICAN ACADEMY OF ALLERGY

The American Academy of Allergy, in co-operation with the University of Georgia, will sponsor an orientation course in allergy from March 7 through March 11, 1949, at the University Medical School in Augusta, Georgia. This course is under the direction of Dr. Leo H. Crip, assisted by other Fellows of the American Academy of Allergy, and a distinguished faculty.

The course is intended for internists and general practitioners, dermatologists, rhinologists and otolaryngologists. The course will include lectures and clinical demonstrations on allergens, hay fever, bronchial asthma, diagnosis and treatment; diagnosis, etiology, pathology and immunology of allergy, allergic rhinitis, atopic dermatitis and other significant manifestations in the field.

Enrollment is open to anyone. The fee is fifty dollars. Applications and inquiries should be addressed to the Executive Office of The Academy, 208 East Wisconsin Avenue, Milwaukee 2, Wisconsin.

INTERNATIONAL AND FOURTH AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY

The International and Fourth American Congress on Obstetrics and Gynecology will be held on May 14-19, 1950, at the Hotel Statler in New York City. A preliminary scientific program has been planned to include the topics of (1) physiology

of human reproduction, (2) the pathology of human reproduction, (3) social and economic problems, (4) neoplastic diseases of the female reproductive system and (5) obstetric and gynecologic procedures. There will be meetings of various groups represented at the Congress, including nurses, nurse midwives, hospital administrators, educators, practicing physicians, investigators in special fields and public health doctors and nurses.

The technical exhibit at the Congress is under the direction of a special committee of which Dr. Woodard D. Beacham of New Orleans is chairman. Dr. John Parks of Washington, D. C., heads the committee in charge of the scientific exhibit. The committee in charge of arranging the motion picture program is under the direction of Dr. Archibald D. Campbell of Montreal.

Inquiries pertaining to the Congress should be addressed to the Chairman of the International and Fourth American Congress on Obstetrics and Gynecology, Dr. Fred L. Adair, at 24 West Ohio St., Chicago 10, Ill.

AMERICAN BOARD FOR CERTIFICATION OF THE PROSTHETIC & ORTHOPEDIC APPLIANCE INDUSTRY, INC.

To improve the professional standards of manufacturers of artificial limbs and braces, and the fitters employed by such firms, an American Board of Certification has been established with headquarters at 336 Washington Bldg., Washington, D. C.

Three orthopedic surgeons and four leaders in the orthopedic appliance industry constitute the national board which will grant certification. The orthopedic surgeons are Dr. Rufus Alldredge, New Orleans, La.; Dr. Henry H. Kessler, Newark, N. J.; and Dr. Atha Thomas, Denver, Colo. Lay members of the board are Chester C. Haddan, Denver, Colo.; Lee J. Fawver, Kansas City, Mo.; J. B. Korrad, Chicago, Ill.; and David E. Stolpe, New York, N. Y. Mr. Haddan is president and Glenn E. Jackson is executive director.

"To be qualified for certification," said Mr. Haddan, "an applicant must prove that he has had at least four years of actual experience under proper supervision or two years of special training and one year of experience. In addition, the applicant must present the signatures of two physicians who state that he meets various other requirements. More than 100 firms and 200 fitters have already applied for certification.

"The medical profession has been of invaluable assistance during the two years of intensive work which has finally resulted in the incorporation of the American Board of Certification of the Prosthetic & Orthopedic Appliance Industry."

POSTGRADUATE CENTER FOR PSYCHOTHERAPY, INC.

The Postgraduate Center for Psychotherapy, Inc., the training associate of the Institute for Re-

search in Psychotherapy, Inc., has been granted a provisional charter from the Board of Regents of the New York State Educational Department. It offers intensive training for psychiatrists in psychotherapy leading to certification; also individual courses for general practitioners and non-psychiatric medical specialists in psychotherapy and psychomatic medicine.

Clinical psychologists and psychiatric case workers are trained in methods that are within the scope of their education and skills, and which can contribute to an integrated program.

The primary aim of the program is to encourage the development of teams of psychiatrists, psychologists, and social workers who can organize and operate community psychiatric clinics.

The courses of instruction include practical demonstrations in psychotherapy as well as lectures. The work of all students is supervised by teachers qualified to manage a specific type of problem. Before the psychiatric student completes his training, he has had personal experience under supervision in the management of various types of cases.

There are required and optional lecture courses. Courses include the principles and practice of psychotherapy; psychodynamics and psychopathology; short-term psychotherapy utilizing psychobiological and psychoanalytical approaches; hypnotherapy; narcosynthesis; shock therapy; group therapy; case work therapy; psychological counseling; child and adolescent psychotherapy; case conferences and seminars; organization and operation of a community psychiatric clinic; projective techniques in psychotherapy; seminar or psychosomatic medicine; therapy of the neuroses and psychoses; compensation and medicolegal problems in psychiatry; anthropological and sociological aspects of psychiatry; and industrial psychiatry.

Therapeutic Program: The Institute, in close cooperation with the Postgraduate Center, also will carry out a therapeutic program. This contemplated activity will consist of the extension of clinic services for those who are in need of psychiatric treatment and are unable to afford the fees of private psychiatrists.

Research: A research program is in process to study and to evaluate all existing types of psychotherapy in order to determine their values and limitations, the kinds of patients benefitted, and the extent and quality of the successes achieved. The aim is to shorten treatment methods and to render them more efficient.

Public Educational Program: The educational program is conducted in several channels; for the lay public, the general practitioner, the specialist in other branches of medicine, and the psychiatrist. It is coordinated with the activities of existing agencies which are working in the same field.

Further information on this program may be obtained by writing to Stephen P. Jewett, M.D., Dean, or to Miss Janice Hatcher, Registrar, Post-

graduate Center for Psychotherapy, Inc., 218 East 70th Street, New York 21, New York.

MEDICAL AND SURGICAL SUPPLIES DESPERATELY NEEDED IN WAR- DEVASTATED AREAS

Continued aid in the form of medical and surgical supplies from America is needed to prevent widespread suffering and death among the peoples of war-devastated areas throughout the world. The members of our profession can help provide such aid through the Medical and Surgical Relief Committee, Inc.

During the past seven years, with little publicity and modest financial support, this Committee has provided more than a million dollars worth of desperately needed medical, surgical and dental supplies and publications to stricken areas overseas. These materials are sent to hospitals, physicians and dispensaries giving *free* medical care to the needy.

Any article or material, routinely used in office or hospital practice, is needed, and the most pressing need of all is for recent medical, surgical and dental textbooks and journals. Please forward any such supplies which you and your hospital can donate to this great need to:

The Medical and Surgical Relief Committee, Inc.,
Room 328—420 Lexington Avenue,
New York 17, New York.

Dr. Allen O. Whipple, of New York City, is Chairman of the Medical Advisory Council, Admiral W. F. Halsey is President of the Board of Directors and Mr. Edward R. Stettinius, Jr., is Chairman of the Board.

DOCTOR WANTED FOR ARKANSAS COUNTY

The Methodist Church is looking for a physician to settle and serve in Newton County, rural northwestern Arkansas, where 10,000 are without a doctor or nurse, and the nearest hospital is twenty-five miles from Jasper, the county seat.

Five years ago the Methodist Church organized the "Newton County Larger Parish", built a stone church in Jasper, and now has two experienced pastors carrying on a program of evangelism, religious education, and community service. The ministers cooperate with the agricultural agent and others in economic betterment, have a farmer's cooperative, etc.

If a doctor can be found for the community, the Methodist Church will organize community support for the erection of a clinic, with a laboratory and a few beds, and will subsidize the establishment until the practice is built up. The doctor will reside in Jasper, will be related to public health and school health, and the state will probably supply a nurse.

For further information, write to Dr. M. O. Williams, Board of Missions and Church Extension, 150 Fifth Avenue, New York 11, N. Y. This is one of a large number of calls Dr. Williams has

for physicians and nurses in the United States or abroad—some of them as missionaries, some, as above, as private practitioners.

NEW OFFICERS OF COMPONENT SOCIETIES

The following officers have been elected by their respective parish societies to serve for 1949:

Evangeline Parish Medical Society

President—Dr. Robert B. Thompson, Ville Platte
Vice-Pres.—Dr. Gordon E. Soileau, Ville Platte
Sec.-Treas.—Dr. Reed A. Fontenot, Ville Platte

Lafayette Parish Medical Society

President—Dr. W. Melancon, Carencro
Vice-Pres.—Dr. Donald B. Williams, Lafayette
Sec.-Treas.—Dr. Edgar P. Breaux, Lafayette
Delegates—Dr. L. O. Clark, Lafayette, Dr. Robert Kapsinow, Lafayette
Alternates—Dr. George Gardiner, Lafayette,
Dr. Donald B. Williams, Lafayette

Natchitoches Parish Medical Society

President—Dr. Joseph Bath, Natchitoches
Vice-Pres.—Dr. E. Preston Ferguson, Natchitoches
Sec.-Treas.—Dr. James V. Kaufman, Natchitoches

Pointe Coupee Parish Medical Society

President—Dr. F. F. Rougon, New Roads
Vice-Pres.—Dr. J. M. Mosely, New Roads
Sec.-Treas.—Dr. Anna Plauche, Morganza
Delegate—Dr. J. C. Roberts, New Roads
Alternate—Dr. F. F. Rougon, New Roads

Washington Parish Medical Society

President—Dr. Frederic Foster, Bogalusa
Vice-Pres.—Dr. H. L. Morgan, Bogalusa
Sec.-Treas.—Dr. Clifford W. Crain, Bogalusa
Delegate—Dr. R. R. Ward, Bogalusa

Second District Medical Society

President—Dr. Joel B. Gray, New Orleans
Vice-Pres.—Dr. Wm. K. Gauthier, Metairie

Sec.-Treas.—Dr. Adrian B. Cairns, New Orleans
Delegate—Dr. Joel B. Gray, New Orleans
Alternate—Dr. Adrian B. Cairns, New Orleans

EDITH LOEBER BALLARD 1875-1948

Dr. Edith Loeber Ballard, member of the Orleans Parish Medical Society, died at Bay St. Louis, Miss., on December 23, 1948. Dr. Ballard was an active member of the State Society since 1914. She was a graduate of Cornell Medical School in 1905.

CHARLES WILLIAMS LEWIS 1896-1949

The St. Landry Parish Medical Society has reported the death of Dr. Charles Williams Lewis on January 6, 1949. Dr. Lewis was a graduate of Tulane Medical School, Class of 1918. He lived and practiced in Eunice, La. Dr. Lewis maintained membership in the State Society since 1921 and served as secretary-treasurer of his parish society in 1938 and as its president in 1940 and 1941.

FRANK RAYMOND GOMILA 1887-1949

Dr. Frank Raymond Gomila died on January 22, 1949. He was a member of the Orleans Parish Medical Society and a member of the State Society since 1914. Dr. Gomila resided in New Orleans. He was a graduate of Tulane Medical School, Class of 1908.

GEORGE H. UPTON 1882-1949

The death of Dr. George H. Upton on January 30 has been reported by the Orleans Parish Medical Society. Dr. Upton was an active member of the State Society since 1914. He was a graduate of the Tulane Medical School in 1907.

WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

WOMAN'S AUXILIARY

The Woman's Auxiliary to the Orleans Parish Medical Society entertained at their annual reception and program in January at the Orleans Club. The guest of honor and speaker at the event was Dr. J. Kelly Stone, president of the Orleans Parish Medical Society. Mrs. Anees Mogabgab, past president, and Mrs. Boni DeLaurel, president-elect, presided at the tea table.

Progress made in the field of the Rural Health Programs was discussed by Mrs. M. C. Wiginton, of Hammond, at the regular January meeting of the Woman's Auxiliary to the East Baton Rouge Parish Medical Society. Mrs. Carl Roy Young, Covington, a past State Auxiliary President, was

also a guest. Mrs. John Ray Powers, president, conducted the meeting.

Members of the Woman's Auxiliary to the Calcasieu Parish Medical Society heard Dr. Walter Moss speak on "Types and Plans for Hospitalization." Miss Frances Moak, librarian of the Charity Hospital School of Nursing, gave an interesting talk on "Nursing as a Career" to the Woman's Auxiliary to the Tangipahoa Medical Society with Mrs. Marshall Scarle, president, conducting the meeting. The Woman's Auxiliary to the Ouachita Parish Medical Society held its annual luncheon in December on the Virginia Roof. At this time the Auxiliary and its guests had the privilege of hearing the famed Ouachita Parish Ensemble. The

president, Mrs. A. Scott Hamilton, presided over the luncheon tables.

"School Health Program" is the title of an article in the December issue of the *Bulletin*, page 129, by Fred V. Hein, Ph. D., Consultant in Physical Fitness of the A. M. A. "Interest in the school health programs has spread throughout the country like an epidemic during the past few years. This program touches the medical profession profoundly. It reaches into the local health department when there is one. It involves the parents and the voluntary health agencies that exist in the community and, foremost, it involves the children themselves, so that all need to be brought into the picture and given a full share in developing the program.

"Certainly I can think of no more fruitful long-term public relations than those which would come out of your participation and the participation of the medical profession in the school health program. The youngsters in school are in the formative stages of development when attitudes toward doctors, towards medical care and towards health in general are being formed.

"Logically, we divide the school health program into three phases. The first we label as health instruction. The second aspect is the health service phase and that is where the doctor comes into the picture most prominently. Health services do not include treatment. They do however include a program for the control of communicable diseases, periodic medical examinations either at the school or at the office and still another phase of health services are screening tests for the detection of visual and hearing defects which can be done by nurses or the teachers themselves. The following program to secure correction of remediable defects through the family and its doctor is also an important part of health services.

"The third aspect of the over-all program is that

of healthful living. This means measures that are taken to make the physical environment sanitary and safe as well as to provide a healthful mental and emotional environment."

In the January issue of *NEWS AND VIEWS* will be found a complete plan of organization of Health Councils for the improvement of School Health Services.

MRS. F. U. DARBY,
Press and Publicity Chairman.

LOUISIANA BRANCH AMERICAN ACADEMY OF GENERAL PRACTITIONERS

The Woman's Auxiliary to the American Academy of General Practitioners extends a cordial invitation to the wives of all members of the A. A. G. P. to join the Auxiliary in time to participate in the activities of the convention meeting to be held in New Orleans May 7 and 8. The privilege of charter membership is being extended for a limited time to those who were not able to be present at the organizational meeting held last April in Alexandria. The Louisiana group of women hold the honor of being the first in the country to form an auxiliary to the A. A. G. P.

Further details of convention plans and announcement of the program will be made in subsequent issues of the *Journal*. It may be possible to arrange a patio party on Saturday afternoon to precede the business meeting on Sunday morning. Mrs. George D. Feldner, general chairman of the convention, Mrs. Esmond Fatter, secretary-treasurer of the group, and Mrs. Edwin R. Guidry, councilor of the New Orleans District will be available for conference with New Orleans women who are interested in being associated with an organization that is of prime importance to the professional careers of their husbands.

MAZIE ADKENS GUIDRY,
Publicity Chairman.

BOOK REVIEWS

Hernia: By Leigh F. Watson, M. D., F. I. C. S., St. Louis, The C. V. Mosby Company, 1948, 3d ed. Pp. 732. Illus. Price, \$13.50.

Although this third edition of Watson's book on *Hernia*, which has been "enlarged and revised" contains a mass of anatomical data and a large number of references on hernia, it is remarkable that it should have gone to press with so many statements and recommendations which are at variance with generally accepted principles and current thoughts concerning the management of patients with hernia. For example, the author states that he believes the injection treatment is much safer for the elderly patient, provided the hernia is suited to this method, based on his fifteen years' experience with the injection treatment.

Many experienced surgeons would take exception to the author's recommendation of the jack-knife position for hernia patients after operation, feeling that this position predisposes to the occurrence of phlebothrombosis in the lower extremities and interferes with the patient moving about freely in bed.

It is surprising that the local use of sulfanilamide in hernia operations is condoned, even though justification for such a practice is limited to cases in which the wound is already infected.

The author's advice that postoperative catheterization should be done only as a last resort because of the danger of cystitis is certainly not in keeping with the thought of many authorities concerning this matter.

A favorable feature of the book is that in the

chapter on "Operations for Inguinal Hernia", the Cooper's ligament operation is presented first, thus reflecting the current trend toward the adoption of this type of operation as the standard operation for inguinal hernia. In discussing the problem of recurrent hernia the author again draws attention to the fact that recurrent indirect inguinal hernia is usually most satisfactorily repaired by the Cooper's ligament operation, reinforced with a fascia flap from the rectus sheath.

AMBROSE H. STORCK, M. D.

Lives of Master Surgeons: By Richard A. Leonardo, M. D., Ch. M., F. I. C. S. New York, N. Y., Froben Press, Inc., 1948. Pp. 469.

From the prolific pen of Dr. Richard A. Leonardo have come eight volumes in a six year period. "Lives of Master Surgeons" is a dictionary-styled reference designed as a supplement to the author's "History of Surgery" (1943), which earlier book includes numerous illustrations and a lengthy bibliography, source material for both works.

Dedicated to the famous Hungarian surgeon, Dr. Eugent (Jenő) Pólya, the record is one of brief, factual accounts of other master surgeons from various historic periods and nationalities. New Orleans medical men will recall the visit in 1939 of Dr. Pólya, "officially declared dead in 1944 . . . a victim of Nazi madness," to quote Dr. Leonardo's words. From Aesculapius to Yperman, the list is alphabetically arranged and includes data of surgeons who are not living; among these are Samuel M. D. Clark, Charles Jefferson Miller, Frederick W. Parham, Edmond Souchon, and Warren Stone.

The lack of an index to the volume and the absence of some outstanding "lives" are omissions to be regretted in what otherwise is a handy reference for students and libraries.

VERA MOREL.

Synopsis of Pediatrics: By John Zahorsky, St. Louis, C. V. Mosby Company, 1948, 5th ed. Pp. 449, 158 illus. Price, \$5.50.

This handbook will undoubtedly continue to have great appeal to practitioners in that the new edition again stresses therapeutic procedures found to be useful at the home and office in the daily work of the pediatrician. Relatively few changes have been made in content or form since the fourth edition; most of these were probably considered necessary because of recent advances in therapy. Unfortunately, perhaps incident to delays in printing as well as to the rapid current strides in the development and use of antibiotics, the book is not up to date in this regard. There are still a number of empiricisms that might conceivably have been justified for the sake of brevity, if not by current research and teaching in pediatrics.

Though this reviewer cannot conscientiously recommend this work for undergraduate medical

students, there is little doubt that it will continue to be useful occasionally as a handy source of reference for many busy practitioners.

R. V. PLATOU, M. D.

Your Baby: Complete Baby Book for Mothers and Fathers: By Gladys Denny Shultz and Lee Forrest Hill, M. D., Garden City, N. Y., Doubleday & Company, Inc., 1948. Pp. 278, illus. Price, \$3.50.

This is the most comprehensive and easily readable book of its sort that the reviewer has come across, and covers everything from conception through the preschool age that a mother and a father will need to know in order to help their baby get a good foundation in life. It answers many questions of both parents that the pediatrician will overlook in his busy routine. The reviewer considers it the perfect solution to the question of both parents: "What book should we have to guide us in our care of our baby?"

SUZANNE SCHAEFER, M. D.

Trichomonas Vaginalis and Trichomoniasis: By Ray E. Trussell, M. D., Springfield, Ill., Charles C. Thomas, 1947. Pp. 277. Price, \$6.00.

This is a comprehensive review of the literature with a bibliography of 1586 references.

The growth and reproductive requirements of the parasite are adequately presented with concise evaluations of the innumerable methods of treatment. The painstaking approach to the problem should enhance the possibilities of specific therapy which is at yet unknown.

To those interested in the further study of the trichomonads, this book is indispensable.

EUGENE H. COUNTISS, M. D.

PUBLICATIONS RECEIVED

Caduceus Press, Ann Arbor, Mich.: *Essentials of Gynecologic Endocrinology*, by Gardner M. Riley, Ph. D.

Grune & Stratton, Inc., New York: *Shock and Allied Forms of Failure of the Circulation*, by H. A. Davis, M. D., C. M., F. A. C. S.

The C. V. Mosby Company, St. Louis: *Cancer of the Esophagus and Gastric Cardia*, edited by George T. Pack, B. S., M. D.

Oxford University Press, Inc., New York: *Reprints of 21 articles published as supplement to the Oxford Loose-Leaf Medicine*.

W. B. Saunders Company, Philadelphia: *Obstetric Analgesia and Anesthesia*, by Franklin F. Snyder, M. D. *Mayo Clinic Diet Manual*, by The Committee on Dietetics of the Mayo Clinic. *Blood Transfusion*, by Elmer L. DeGowin, M. D., Robert C. Hardin, M. D., and John B. Alsever, M. D. *Clinical Aspects and Treatment of Surgical Infections*, by Frank Lamont Meleney, M. D., F. A. C. S. *The Business Side of Medical Practice*, by Theodore Wiprud.

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DUODENAL ULCER: APPRAISAL OF CURRENT METHODS OF MEDICAL TREATMENT*

G. B. EUSTERMAN; M. D.,†
ROCHESTER, MINNESOTA

One of the striking present day medical phenomena is the prevalence of duodenal ulcer. Many competent observers at home and abroad are of the opinion that this disease is definitely on the increase throughout the civilized world. The nature of treatment of such a disorder, affecting as it does the health, efficiency, and life of many adult members of every community,¹⁰ should be of universal interest. It is now estimated that 5 per cent or more of people have peptic ulcer at some time during their lives, and that more than 375,000 individuals consult physicians each month throughout the United States because of disorders arising from ulcer. Yet, only about 1 out of every 4 ulcer-bearing patients has disturbances of sufficient degree to consult physicians or to be hospitalized.

Both physicians and surgeons are generally agreed that uncomplicating gastric ulcer and duodenal ulcer, particularly the latter, should be treated medically. The trend from surgical to medical management is shown in figure 1. Lahey and Mar-

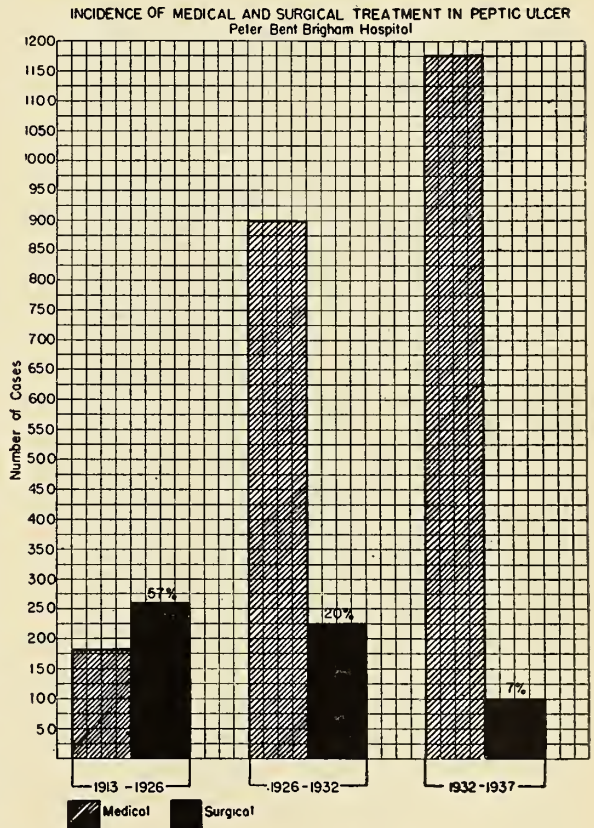


Fig. 1. Trend from surgical to medical management of peptic ulcer in a representative Eastern hospital. (From Zollinger, Robert: *The Surgical Aspects of Peptic Ulcer*. Rhode Island M. J. 21:113 (Aug.) 1938.

shall, in 1943, reported operating on 6.5 per cent of 6,500 patients who had duodenal ulcer and 18 per cent of 450 patients who had gastric ulcer. The trend and percentage of patients with duodenal ulcer who underwent operation at the Mayo Clinic from 1928 through 1942 is shown in figure

*Read at the annual meeting of the Louisiana State Medical Society, Monroe, Louisiana, April 14, 1948.

†Division of Medicine, Mayo Clinic, Rochester, Minnesota.

2. Up to and including 1946, 60 per cent of the patients with gastric ulcer were

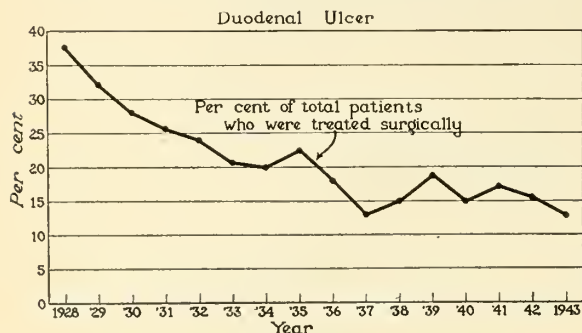


Fig. 2. The trend, from 1928 through 1943, of the percentage of patients with the diagnosis of duodenal ulcer who were treated surgically at the Mayo Clinic.

submitted to operation. However, in the past two years there has been a sharp decrease, only about 35 per cent being operated on in 1947. The tendency toward increasing conservatism in the case of uncomplicated ulcers is evident in spite of the uncompromising attitude of some surgeons, particularly with respect to gastric ulcers.

As on many other points in the realm of gastroenterology, authoritative opinion is divided as to whether the patient who has duodenal ulcer shall be treated in ambulant fashion or be sent to the hospital. There are those who maintain that hospitalization; is not essential in the majority of cases, while others regard it as highly desirable and rather insist on it as a routine procedure. Treatment and observations in the hospital are indicated, as a rule, under the following circumstances: when there is a coexisting gastric ulcer; when some complication, such as gross bleeding, exists or is impending; when there is gastric retention or threat of perforation of a penetrating lesion; when the pain is severe or more or less persistent; when the patient is highly nervous, exhausted, or hypersensitive, or it is felt that he will not adhere strictly to an ambulatory regimen; when it is essential that he or she be relieved of the cares of office or home, for only in this way can physical and mental rest be secured and effective treatment be carried out at the same

time. However, the fact remains that the majority of patients are treated in ambulant fashion, and with the rising cost of hospital care, the shortage of beds and nurses in the United States during and since World War II, more and more patients necessarily will be treated in ambulant fashion. Although the average cooperative patient who has a relatively mild uncomplicated ulcer does very well when treated in ambulant fashion, in my judgment, the previous treatment of the majority of patients who come under my observation has been inadequate. One is reminded of Moynihan's criticism that the failure of medical treatment was attributable to its insufficiency and that few patients received any treatment which offered a reasonable prospect of healing the ulcer. This is regrettable because proper and adequate treatment instituted at an early stage of the disease is the best guarantee of permanent cure with the least expenditure of time, effort and money.

The first objective is to heal the lesion and the second objective is to keep it healed or prevent a recurrence at the same site or elsewhere. Not only is the latter more difficult to obtain, as a rule, but its importance has not been sufficiently stressed in the past. Whether ulcer is regarded as a separate entity, or as the local manifestation of a general systemic derangement, the patient, as a whole, must be encompassed in the therapeutic planning. This, apart from a complete physical inventory, presupposes tactful inquiry into the psychosomatic and environmental aspects, and into matters of personal habits and daily mode of eating, working, and sleeping. In a given case, the degree and baneful effect of emotional tension, physical fatigue, focal infection, alcohol, tobacco, strong tea and coffee, condiments, stimulating or coarse foods, improper mastication from whatever cause, dysfunction of the bowel or associated disease of other viscera must be determined. Continued cooperation with respect to diet, medication, personal and mental hygiene is usually achieved only by fully acquainting the patient with the na-

ture of his disease and with the rationale underlying treatment. There is much justification for the old adage: "Once an ulcer patient, always an ulcer patient." The tendency for the patient to throw off all restraint after he has experienced comfort for several weeks or longer must be zealously guarded against; otherwise, recurrence is in the immediate offing.

CHOICE OF METHOD OF TREATMENT

Because of disagreement concerning its cause and the fact that prevailing methods may not be completely satisfactory, innumerable cures have been suggested for ulcer. Many of these so-called cures are in vogue for a short time and then are discarded as their predecessors have been. Like purported cures for cancer and tuberculosis, past experiences have repeatedly taught me to be just as suspicious of ulcer cures as of the former. I also look with disfavor on parenteral methods of treatment of the ordinary uncomplicated duodenal ulcer. The evaluation of unorthodox forms of treatment is difficult at times because some ulcers heal spontaneously, and many heal after little treatment. Moreover, the clinical course of the disease is characterized by variable periods of remission and exacerbation, and such remissions, especially if prolonged for one reason or another, could easily lead to a false appraisal of the value of the type of treatment instituted. Symptomatic relief is no criterion of healing. There must be anatomic restoration as well. The bulbar deformity of a duodenal ulcer of several years' duration may persist after complete healing has taken place, although the crater (niche) of such an ulcer when present should have disappeared.

Recent progress in the treatment of ulcer, in Winkelstein's opinion, has been characterized by the introduction of aluminum preparations, continuous intragastric drip, protein hydrolysates, the psychosomatic approach, and vagotomy. As vagotomy is purely a surgical procedure, it will be omitted from present considerations. The logical therapeutic procedure is one that takes into consideration the results of experimental

research in the production of ulcer, the morbid physiologic processes in the presence of an active duodenal ulcer and the lessons gleaned from clinical observation on the part of physicians and surgeons alike. Hence, the majority of physicians subscribe to the principle of a bland, soft, and nutritious diet, frequent feedings, antacids, temporary use of sedatives and antispasmodics, physical and mental rest and other auxiliary measures whenever indicated. Although the role of corrosion or digestion by the acid gastric juice is unlikely the sole one in pathogenesis, the effectiveness of neutralizing agents should not be minimized. Dragstedt has recently re-emphasized the noteworthy fact that the medical management of duodenal ulcer has been successful directly in proportion to the degree in which the acid gastric juice has been neutralized during the entire twenty-four hours. Successful surgical treatment is based on the same premise.

CHOICE AND EFFECT OF ANTACIDS

The use of nonabsorbable preparations of aluminum hydroxide in the form of a liquid gel or tablet has replaced the former use of the salts of sodium, calcium, magnesium, and bismuth capable of systemic absorption and their hazards. Aluminum hydroxide also has adsorptive, bactericidal, mild astringent, and demulcent properties. The degree of neutralization of gastric acidity which is necessary for ordinary purposes is achieved at the so-called proteolytic neutralization point; that is, at a pH of 4.5 to 5.0. Complete neutralization requires an elevation of the pH to at least 7. Adequate neutralization throughout the day and night is exceedingly difficult to attain in 80 per cent of cases except by continuous intragastric drip. In spite of this fact and without continuous intragastric drip the majority of patients experience relief and the ulcer frequently heals. Voegtlin has recently called attention to the difficulty of reducing the nocturnal acidity by the usual methods, but has stated that healing may proceed nevertheless.

My choice of an aluminum hydroxide preparation for the past five years has

been the gel or tablet in combination with magnesium trisilicate. The investigations of Batterman and Ehrenfeld have demonstrated that the addition of the latter increases the effectiveness of the former and decreases its constipating effect as well. This preparation in tablet form is for the convenience of the patient when away from home or in the office. Another tablet as a convenient substitute for the inter-meal milk feeding is one made of compressed skim milk in combination with calcium carbonate.* The continuous drip treatment using aluminum hydroxide gel or alkalized milk is employed only for patients who have refractory ulcers and are tolerant to such method.

INDICATIONS FOR, AND CHOICE OF, SEDATIVES AND ANTISPASMODICS

Since many ulcer-bearing individuals are a nervous, tense, hyperreactive, and irritable lot, their sleep is not restful and usually they are mentally and physically exhausted. While treatment in the hospital affords complete rest and relaxation which is conducive to healing, nevertheless, the circumspect use of sedatives and antispasmodics is indicated from the outset to facilitate recovery. For obvious reasons, such medication is even more imperative for that great majority of patients treated in an ambulatory way. While rest, dietary measures, antacids, and frequent feedings per se relieve the pain and characteristic gastric neuromuscular disturbances in whole or large part, sedative and spasmolytic agents should hasten and insure such action.

Belladonna and its alkaloids, atropine, hyoscyamine, and scopolamine, have been prescribed for centuries by the medical profession as antispasmodics in the treatment of gastrointestinal disorders. In more recent years, a variety of synthetic preparations bearing familiar proprietary labels have been manufactured. Several more recent synthetic preparations have a combined analgesic and antispasmodic effect. A variable combination of sedatives and antispasmodics also is available in tablet

form, and aluminum hydroxide preparations in gel or tablet form have been made in combination with synthetic antispasmodics and sedatives. Thus the modern physician has a much wider range of such preparations to choose from now than formerly.

Certain precautions are necessary in the use of all drugs of this nature. The idiosyncrasy of many persons toward belladonna and its derivatives is well known. Moreover, the amount of sedation required to achieve the desired effect without impairing the patient's efficiency is a variable one. As Kilstein has observed, the problem is that of proper dosage of phenobarbital or its equivalent with suitable antispasmodics in harmonious combination. This dosage and combination not only should provide a maximum of effect but should be in such proportions that it can be used for a prolonged period if that should prove necessary. One of my favored combinations is a powder or capsule containing 1/4 grain (16 mg.) of phenobarbital; 1/24 grain (2.7 mg.) of homatropine methyl bromide and 20 grains (1.3 gm.) of calcium gluconate.

TREATMENT WITH PROTEIN HYDROLYSATES (AMINO ACIDS)

Levy and Siler, in 1942, suggested, and Co Tui and his associates developed, the use of amino acids. While the proponents of this form of treatment have advocated it for all ulcers, I have never seen the justification except when hypoproteinemia, as a result of hemorrhage, pyloric obstruction, or malnutrition from whatever cause is present, assuming the patient can tolerate a preparation which decidedly has an unpleasant taste which is difficult to disguise. Protein deficiency in the patient with an uncomplicated ulcer is usually absent or minimal. Additional proteins are of secondary importance in treatment if the patient's diet otherwise is adequate. After judicious and impartial appraisal of other aspects than those already mentioned, namely, buffering value, effect on gastric motor function, immediate and late clinical results, it seems safe to predict that protein hydro-

*Nutrachloric tablet (Upjohn).

lysate therapy per se will not enjoy a widespread and sustained popularity.

DIETETIC TREATMENT

The keystone in the therapeutic arch is a proper diet. At the clinic we subscribe to the principle of (1) food devoid of chemical, mechanical, and thermal irritation, (2) food of bland nature readily evacuated by the stomach, and (3) the taking of such food at frequent intervals, particularly in the earlier stages of treatment in order to minimize or control the corrosive action of the gastric juice, especially in the interdigestive phase. Vitamin concentrates and preparations of iron also are prescribed whenever the indication exists. At stated intervals, depending on the progress made, an increase in the amount and variety of the food is permitted. At the clinic we have devised a booklet³ which is helpful in instructing patients.

TREATMENT FOR AMBULANT PATIENTS

The reader should consult the textbooks by Bockus, and by Eusterman and Balfour, or the chapter by Palmer in Portis' textbook, for a description of the details of treatment in the hospital. At the clinic the ambulant patient undergoing treatment is instructed to start either on the "B" or "C" diet, as outlined in the booklet just mentioned. The diet chosen depends on the severity and duration of the symptoms. The "B" diet consists of three small meals of cereals, cream soup, simple desserts, and orange juice, and 120 cc. of milk and cream each hour in addition. At intervals of one to two weeks the diet is increased successively to the "D" diet and then to the regular ulcer regimen for ambulatory patients. For the first two or three months the patient takes 30 cc. of a mixture of aluminum hydroxide and magnesium trisilicate in gel or tablet form one hour after each meal and at 11 a. m., 4 p. m., and bedtime. At intervals of two hours from 7 a. m. to 9 p. m., 120 to 180 cc. of whole milk is consumed for a similar period. The regular "ambulatory ulcer diet" is followed for a year. After the patient has been using this diet for three or four months the dose of aluminum hydroxide and magnesium trisilicate is de-

creased to 15 cc. or one tablet. A sedative-antispasmodic preparation of the physician's choice is taken from the outset fifteen minutes before the three regular meals and at bedtime for a period of two to four weeks. The degree of success achieved is often directly in proportion to the cooperation given by the patient.

SUMMARY

Considerations pertaining to treatment of duodenal ulcer should command universal interest because of the ubiquity and increasing incidence of this disease throughout the civilized world. The trend has been from surgical to medical management of the uncomplicated duodenal ulcer in the past two decades. While the majority of patients are ambulatory during treatment, the indications for and advantages of treatment in a hospital are also discussed.

In the past, treatment in most cases has been inadequate. Proper and adequate treatment at an early stage of the disease is the best guarantee of permanent cure. To heal the lesion is the first objective and to prevent a recurrence is the second. This second aspect is more important, is difficult to attain, and is often neglected.

The introduction of preparations of aluminum hydroxide, continuous intragastric drip, the psychosomatic approach, and probably vagotomy and protein hydrolysates, has characterized recent progress in the treatment of ulcer. Arguments for the choice of the method of treatment as prescribed by the writer are advanced. A brief outline of the procedure for the ambulant form of treatment is included.

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SURGICAL VIEWPOINT OF LEG ULCER WITH PARTICULAR REFERENCE TO POST-THROMBOPHLEBETIC ULCER

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NEW ORLEANS

Leg ulcers have been more or less despised by the surgeon and have been regarded by the profession in general as 'dressing problems. The disadvantages of this attitude to the patient have been numerous and discouraging. The hope of a patient for a cure has been permitted to languish and disappear. Ultimately such patients learned to tolerate an open infected sore, often painful and malodorous. Many new advances have been made, however, and in reality the prophylactic and active treatment of leg ulcer today is justifiably and increasingly more optimistic. More can be done to prevent these severe complications,—for complications they are,—and more can be done to actually cure them.

In order to comprehend the problem in general it is necessary to view it systematically, divided into various components. I have made a classification of indurations of the leg and leg ulcers, based on etiology.¹

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The advantages of such a classification may be obvious. The factors responsible for an ulcer should be considered and then attention should be directed to the alleviation of of the individual cases. Since in the majority of instances a number of different factors are operating to produce the ulcer, several different therapeutic measures may be indicated. If one simply removes one of the causes, only a 25 per cent factor in the ulceration, a cure should not be expected. It is easy to direct attention to one cause of an ulcer and to overlook others which may be even more potent in producing the vitiated physiology responsible for that lesion.

The classification which I have outlined includes under nine different headings all of the various causes which may operate either individually or collectively to produce leg ulcers. They may be enumerated as follows:

1. Post-thrombophlebitic edema.
2. Varicose veins.
3. Obesity.
4. Trauma.
5. Infection, either pyogenic or fungous.
6. Lymphedema.
7. Arteriovenous communications.
8. Immersion leg.
9. Systemic causes.

When viewed as a problem of removing one or a number of these various factors in a patient with a leg ulcer the entire ques-



Fig. 1. Post-thrombophlebitic edema ulcer in a young woman, aged 27 years. The deep vein thrombosis occurred in a puerperium six years ago. The ulcer has been present for two years. It was very painful. A lumbar sympathetic ganglionectomy was performed followed by excision of the entire indurated area and skin graft. The patient has remained well now for one year.

tion becomes very complex, involving an extent of knowledge and experience and technical ability which will tax the surgeon

in order to obtain satisfactory results for the patient. This makes it all the more interesting, and when the various different therapeutic measures which may be used systematically or locally, and the operative procedures which may be indicated, are all considered, the modern surgical aspects of leg ulcer become an intricate engaging problem. Today leg ulcer is certainly something more than a dressing problem.

I have seen leg ulcers, for which the patient came as a primary complaint, attributable to a toxic nodular goiter with cardiac decompensation. Trauma, also, in



Fig. 2. The results of bilateral excision of indurated areas for bilateral post-thrombophlebotic edema ulcers. The patient aged 58 had had recurrent ulcers on one leg for thirty years and on the other leg for ten years. She had suffered great pain with the ulcers which previously had been treated as dressing problems. She has remained well for over one year.

these instances may be an additional factor. I have seen leg ulcers attributable to a disturbed venous return circulation which in turn was caused by funnel chest. The proper solution of the problem in these instances then becomes one of thyroidectomy and operative correction of the deformed sternum. Various other systemic causes, whether medical or surgical, can thus be the real problem for solution of leg ulcer.

One of the most common leg ulcers presenting itself in private work is post-thrombophlebotic edema ulcer. My experience, now over a period of some twenty years of intense interest with vascular disease, has led me to certain crystallized conclusions

regarding this problem, conclusions which frequently do not coincide with the opinions usually expressed in the literature. At other times they are in definite agreement with such expressed opinions. One of the most controversial of all the problems today is that of deep vein thrombosis of the lower extremity. From a clinical standpoint two different aspects must be considered: (1) the danger of pulmonary embolism which exists following a thrombosis of the veins of the lower extremity; (2) the residual, a persisting edema in the lower extremity which may ultimately lead to ulceration. The problem of pulmonary embolism has received frequent consideration in the literature in recent years. To prevent pulmonary embolism ligation and section of the femoral vein or the iliac vein has been advocated rather forcefully by certain authors. The profession in general apparently has taken a relatively conservative attitude towards this. Moreover, it now becomes apparent that anticoagulants alone can produce results statistically superior in the salvage of life to the results following operative transection of the femoral vein.^{2,3} Perhaps heparin and dicumarol will soon replace most of the surgery done to prevent pulmonary embolism. It is my personal opinion that ligation and transection of the femoral vein never can be done without permanently damaging the return circulation in the lower extremity. I know this is not acknowledged by most authors. On the other hand, in those instances in which I have transected the femoral vein, and in those cases that I have encountered subsequent to its performance elsewhere there has always been a diminished return circulation which created either a manifest or latent edema of the lower extremity. Many of these patients will not show a manifest edema simply because they are not called upon under stress to use their legs. If they must work eight to twelve hours a day the leg on which the ligation has been done will most assuredly show edema whereas the normal leg will not show it. Statistics themselves are misleading. They have been used to

point out the immediate salvage of life following operative transection for deep vein thrombosis in the lower extremity. Like many statistics they are not overwhelmingly convincing. Moreover these statistics never seem to take into account the subsequent life of that patient, after he has been saved. Many of these individuals become chronically partially disabled because of swelling and pain in the lower extremity and sometimes because of ulceration. They may be unable to work long hours or if they are young they may be unable to meet successfully the severe competition they find on every side during life. For this reason, some consideration should be given as to whether ligation of the femoral vein is an advantage to the patient in his subsequent life, not just a question of a slightly improved chance to save his life at the time of a fresh thrombosis. Is it better to salvage 1 or 2 more people out of 200 by imposing on 50 out of 100 a certain amount of increased invalidism? I take a very conservative attitude towards ligation of the femoral vein. I believe that it is indicated at times and my criteria as to the indications for surgical interruption of the femoral vein to prevent pulmonary embolism are: first, after a patient has had a minor embolus, to prevent the occurrence of a grave embolus which may subsequently follow; second, it may be employed to diminish the expected post-thrombophlebitic edema if the patient has had a very extensive thrombosis with massive edema. Transection of the vein and removal of this embolus may permit better development of collaterals and thus insure a subsequent life with less post-thrombophlebitic edema than would be present if the massive long thrombosis was permitted to remain in the vein itself. Shorter less extensive thrombi may more adequately be taken care of by anticoagulants. This is a clinical viewpoint which I have carefully and critically observed and believe to be true. There is no attempt to prove it statistically.

Usually the immediate factor which leads up to leg ulcer is edema. The prevention of this edema is highly important. The

skin in and around the internal malleolus of the leg has less vitality, less metabolic activity than any skin of the body. When one considers how rapidly wounds of the face and neck heal and how slowly those heal on the lower extremity in the region of the ankle, this fact becomes apparent. Wounds heal slowly in the region of the ankle, and other pathologic processes such as abscesses retrogress slowly. No matter what the cause of the edema, it should be prevented from accruing day after day. If trauma has occurred it is going to take longer for the results of the trauma, that is the edema and swelling or laceration, to heal and dissipate than it would if the same amount of reaction to trauma had occurred on the upper extremity. When the patient is up the recurrence of daily edema is facilitated, and it is necessary to have them interrupt the consecutive hours of dependency of the lower extremities. It is not altogether the total hours a patient is up during the day but the number of consecutive hours which fosters the accumulation of edema in the lower extremity. For that reason interrupted rest and elevation of the leg, when a cause for edema exists, will prevent subsequent hardening and induration of the subcutaneous tissues, which ultimately may lead to an ulcer. When one cause of edema is present, such as a deep vein thrombosis, then the patient, following the establishment of a new cause, such as infection or trauma, must be doubly cautious and must repair to bed for fear that the combination of the two causes will increase the thickening of the subcutaneous tissue and cause pigmentation and dermatitis and ultimately ulceration. It is much easier to prevent ulceration than to cure it.

What then, is the method of controlling edema following thrombosis involving deep veins of the lower extremity? It is my view that these patients should immediately be told that they will be six months to a year recovering from this complication. Then I insist on measures which "keep them under the edema level." If they are conscientious, if they do not permit the leg to swell day after day, if they are persistent

in taking interval rests with their leg elevated during the day at first, never missing a midmorning and a midafternoon period, the results are usually excellent. Adequate return circulation establishes itself after a long time. After a year they may expect to resume completely normal activity with no evidence of daily recurring edema. On the other hand, if the patients, accepting an idea that ultimately the swelling will diminish spontaneously, stay up continuously day after day and permit recurrent swelling, the intercellular spaces become large and are ready to receive edematous fluid again the next day; thickening and scarring of the subcutaneous tissue results and the leg never can return to normal.

Immediate therapeutic measures which already have been mentioned should not be overlooked. They will not be discussed in detail. Foremost among these are anticoagulants, particularly heparin in a Pitkin's menstruum, ligation in certain instances, with removal of the clot, and various other measures, including sympathetic nerve blocks with procaine. They may be helpful and proper in certain cases. No one measure should be used to the exclusion of all others. These may take the patient over the immediate phase, but the long continued clinical, or subclinical edema which results day after day is another phase which doctors have relegated to the patient. The doctors should recall this responsibility, instruct the patient how to avoid it, and thus ultimately obtain a good collateral circulation which will be adequate to carry on an active life.

When post-thrombophlebitic edema ulcer has occurred then a variety of measures have been suggested for its relief. Various types of dressings and local applications have been used, such as gentian violet, zinc peroxide, Unna paste boot, compression bandages, sulfonamides, penicillin ointment, dried red blood cells, tyrothricin, chloresium and numerous other measures. Some of these are helpful. Let me here endorse dried red blood cells which seem to have a definite effect both in cleaning the granulations and in stimulating epithelialization.

But no amount of local application will heal the ulcer when the factors which are responsible for it are permitted to be maintained.

Sympathectomy has been advocated for this condition. I have performed it in a number of cases. I believe there is a place for it. In younger individuals with a mild dermatitis and weeping of the skin and daily recurring edema, sympathectomy seems to help tremendously at times. It dries the skin, improves the arterial circulation and seems to diminish the venous stasis. I have been disappointed with it in older individuals, and it certainly is not a dramatic cure in itself for post-thrombophlebitis edema or for post-thrombophlebitic edema ulcer. It may be a helpful aid in certain cases. Another measure which has recently been advanced by Buxton and Coller¹ is transsection and ligation of the femoral vein in long standing cases of old deep vein thrombosis. I mention this to condemn it. It is my opinion that transsection of these veins, just as one would expect, makes the condition worse. Moreover, at the same time, I would like to condemn ligation of varicose veins when the patient has had a definite history of deep vein thrombosis. I have gone through the disappointment following such a ligation a number of times. I have felt that even though the patient has had a deep vein thrombosis the varicosities with their incompetent veins and retrograde flow must be additional factors in the edema and ulceration, and thus have been tempted to conclude that ligation without the use of sclerosing solution may be helpful. Everytime I have tried it I have regretted it. I would advise strongly against the ligation of the saphenous vein when it is varicose, when there has been a previous thrombosis of the femoral vein with daily recurring edema. Those of you who insist on trying this yourself, if open minded and critical of your own results. I believe, will ultimately come to the same opinion which I have established. My experience leads me to believe that one should not transect more veins after a deep vein thrombosis.

In reality you would expect the physiology not to be improved and such clinically, not from laboratory experimentation but from a clinical observation, is actually the result. The theory that transsection and ligation of the deep vein after it has been thrombosed will obviate the spasm in other vessels and thus permit better collateral return, or that it lessens hydrostatic pressure in the deep system, does not prove tenable from clinical experience.

One last measure which I wish to endorse is a very modern dramatic advance in the surgical management of post-thrombophlebitic edema ulcer. For these instances where induration has occurred, and it practically always occurs above the internal malleolus on the inner and lower third of the leg, the tissue which is involved is the subcutaneous tissue and skin. The circulation seems to be adequate for all other parts of the extremity, including the foot. It is surprising but edema following deep vein thrombosis usually does not affect the foot. This may be attributed to the fact that the return circulation from the foot goes up the deep veins and from the inner side of the leg it returns through the long saphenous system. The measure which we have found most acceptable, most dramatic and most helpful is to excise the tissue which does not have adequate venous return, that is the skin and subcutaneous tissue and the fascia in the area above the internal malleolus. This includes the ulcer and the hard indurated area. Then a split graft is placed down onto the muscles and onto tissue which has a more normal return circulation. This graft, then, without edematous fat, and fibrous subcutaneous tissue is able to withstand the demands put on it by daily dependency. It has adequate return circulation and will remain viable. We have obtained excellent results by this method in at least 90 per cent of the cases. These patients' legs are healed and remain healed. The idea of excising an ulcer and putting a graft on it is old; the concept that the removal of all tissue which does not have adequate return circulation is the optimum method of managing post-thrombophlebitic

induration and ulceration may be new. I believe that this concept will gain importance in the surgical management of this condition. Sometimes in these cases, in order to secure a dry leg and avoid a weepy dermatitis frequently associated with these cases, we perform a sympathectomy as an adjunct measure.

Numerous other factors responsible for these ulcers should be considered. Neither space nor time permits me to go into detail concerning our viewpoint on varicose ulcer, traumatic ulcer, and ulcer due to obesity and infection. Practically the same attitude regarding these is at present our concept regarding the therapeutic problem. The entire problem becomes very complex. There are many surgical measures to be used. A lot can be accomplished for these patients to restore them to a normal and active existence. For this reason, leg ulcer is no longer just a dressing problem. It is a problem in which brilliant surgical results may be obtained by the properly directed measures.

SUMMARY

A classification of leg ulcer based on causes is given. A new concept of leg ulcers, forming a complex surgical viewpoint, is discussed. Much can be done to alleviate these conditions and to cure these patients permanently. Leg ulcer has been removed from the category of a dressing problem into the category of a surgical problem.

Ligation of either the deep or the superficial venous system of the lower extremity following deep vein thrombosis is condemned. It does harm. A new concept of excision of tissue which cannot be maintained normal by the return circulation, so deficient following a deep vein thrombosis, has been expressed. Excision of ulcers of the lower extremity and skin grafting, removing all tissue not adequately maintained by the circulation, gives brilliant results in over 90 per cent of the cases.

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GOUT, AN ANCIENT AND NEGLECTED DISEASE*

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"Screw up the vise as tightly as possible, and you have rheumatism," said Dr. Morris Longstreth almost a century ago; "give it another turn and that is gout." The following typical case is illustrative of this disease.

A white male, aged 52 years, had attacks of pain in the first metatarsophalangeal joint of the left foot two or three times a year for ten years. The original attack, however, was first experienced in the left wrist, which became swollen, red, and very painful to touch. At that time his family physician thought that it was due to an insect bite. The attacks were limited to these two joints except for the last attack which involved the right wrist and the right ankle. The patient could usually predict when an attack was impending by a feeling of marked lassitude about twenty-four to forty-eight hours in advance. He responded well to colchicine and aspirin therapy.

The physical examination revealed nothing of consequence. The arterial pressures were 120 mms. of mercury systolic and 80 diastolic, with a cardiac rate of 70 beats per minute. Following the last attack of gout, which was the most severe, he became aware of a small hard area about the size of a number 6 shot located over the right mastoid process. This mass was excised and sodium urate crystals were demonstrated microscopically. Kidney function as determined by the test employing posterior pituitary extract was within normal variation.

Repeated roentgenograms of the left foot failed to reveal any abnormalities for a period of ten years, until his last attack when punched-out areas almost 2 to 3 millimeters in diameter were observed on the head of the metatarsal bone and the base on the proximal phalanx on the left great toe. It is worth emphasizing that a questionable area of calcification in the thoracic aorta was present. Uric acid levels varied from 4.5 mg. per 100 cc. between attacks to 7.5 mg. per 100 cc. during attacks.

Like other more rare diseases in medicine the frequency with which gout is diag-

nosed depends upon the criteria which are employed. It is, however, generally accepted that from 5 to 8 per cent of all cases of joint disease are due to gout. One may define this disease as a disturbance in metabolism associated with an increase of urates in the body, particularly in and about the joints, with the later development of a chronic deforming arthritis. Deranged purine metabolism plays an important role in this disease. In purine metabolism, the protein is broken down to nucleoproteins and further broken down to nucleic acids by trypsin. It then proceeds through the various secondary but nevertheless highly important stages to nucleotides and to adenine and guanine, and finally to xanthine and uric acid. Because individuals who have gout have uric acid blood levels usually in excess of 6 mg. per 100 cc. of blood, an explanation for gout should account for this increase in blood uric acid. Three possibilities suggest themselves: (1) a diminished destruction of urates by the body, (2) a decreased excretion by the kidney, or (3) increased formation by the body. It is generally accepted that there is no good evidence that urates are destroyed by the body. A decrease in the ability of the kidney to clear the blood stream of urates is accepted by many as the prime cause of the disease, although some authorities, particularly Talbott,¹ think that gout results from an increased production of urates by the body. Both schools of thought, however, agree that individuals who have had gout over any great length of time have impaired renal function. No attempt will be made here to review in detail the pathologic alterations of gout other than to point out that the urate deposits, both subcutaneous and osseous, are the characteristic lesions of gout and that they act as foreign bodies so that the response is one of inflammation. Frequently the joint changes are similar to those of hypertrophic arthritis, on the one hand, and again, may resemble in some features the rheumatoid variety. The kidneys show punctate areas throughout the cortex and in the medulla. Although there may be various forms of

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glomerulonephritis present it is generally accepted that these are coincidental findings. It is worth noting that individuals who have gout exhibit a greater frequency of arteriosclerotic changes both in the general and coronary circulation, and cardiac changes are commonly observed of the type usually found in individuals who have hypertension of long standing.

The relative frequency of the disease has already been discussed. Approximately 95 per cent of the individuals suffering from gout are males, which suggests that the disease is of a sex-linked character although recent work would indicate that about 10 per cent of cases are in females.⁴ Since the original description of Sydenham, the age incidence has usually been given as the fifth decade of life, but many cases have been reported in extremes of age and it is not unknown that at 6 to 8 years children may suffer with the disease as well as individuals over 70 years. Although there are many physicians of considerable repute who believe that overindulgence in rich food and alcoholic beverages is an important etiologic agent in the production of gout, evidence is accumulating that there is no preponderance of gout in any social stratum or in relationship to the varieties of food or drink taken. In this respect, gout may be compared with diabetes. Excessive intake of sugar does not cause diabetes, nor does excessive intake of purines or alcohol cause gout, but once the disease is present, excessive intake of the respective foods accentuates the symptoms and signs.

Typically the premonitory symptoms of acute gout are malaise, depression, and mild nonspecific gastrointestinal disturbances which usually precede the attack by twenty-four to forty-eight hours. These are followed by pain in a joint which may occur at any time of the day but frequently is observed at night. In the majority of cases, the metatarsophalangeal joint of the great toe is involved, hence the synonym *podagra*. After the great toe, and in decreasing frequency, come the other joints of the foot, the knee, the hand, the shoulder, and the

vertebrae. Usually one joint is involved at a time although polyarticular attacks do occur, or as one joint subsides another may become involved. The joint swells rapidly, becomes hot, tense, and shiny. The color is that of a deep bluish red. The involved joint is extremely sensitive and the patient frequently describes the pain as though the joint were in a vise. Usually there is an elevation in temperature ranging from as high as 102° to 103° F., with accompanying polymorphonuclear leucocytosis. Towards morning the severity of the symptoms subsides and although the joint may remain swollen, the day is spent in comparative comfort, only to have the symptoms recur the following night. If untreated, the attack usually runs its course in from five to eight days. Diuresis may precede the attack by a day or two. With it, however, there is gain in weight from a decreased loss of insensible perspiration.⁵ A drop in the barometric pressure frequently precedes the weight gain and diuresis and these cyclical changes may account for the fact that many patients with gout can predict a day or so ahead of time that they are in for another siege. The prognosis in most patients with gout is a guarded one. The widely used dictum "once gouty, always gouty" is usually true, but it is quite evident that in essence the short term prognosis rests upon the degree of irreversible changes which have taken place particularly in the kidneys and cardiovascular system.

In spite of the very evident inflammation there is never suppuration of the lesion. Usually if the attack has subsided, the patient feels better than he did prior to the attack, and the joint is restored to its normal function. Ordinarily, an individual will experience three or four attacks a year, and with increasing frequency of the attacks, the joint symptoms persist longer and gradually many joints become affected so that finally considerable joint changes take place, and after a number of years, the joint may become swollen, irregular, and deformed. It is, of course, at this stage, that the roentgenogram shows

punched-out defects in the bone but these appear too infrequently to be of great help in the diagnosis of this disease.

Patients with chronic gout almost invariably present evidence of generalized arteriosclerosis with an increase in arterial pressures and cardiac hypertrophy. Kidney function is usually decreased. The volume of urine is increased with a low specific gravity, a few hyalin casts and a trace of albumin. Examination of the cartilages of the ear particularly reveal tophi which, when examined microscopically, or chemically, disclose uric acid crystals.

A complication of gout that is especially deserving of mention is renal stones. Brochner-Mortensen² reported that 15 per cent of his patients with gout passed renal stones. Hench³ states that gouty nephritis affects about 10 per cent or more of gouty patients. Because of this, in a patient with renal colic, gout should be considered as an etiological possibility, and if associated with the renal colic, there is a history of acute or chronic arthritis, the possibility of gout should be thoroughly investigated. It should be remembered that urate stones are not radio-opaque.

It has been the experience of some that an attack of gouty arthritis may be easily provoked by a surgical procedure and other trauma. Linton and Talbott⁶ noted post-operative arthritis in 86 per cent of their patients with gout following twenty-two surgical operations. Another provocative that is worth emphasizing is medicinals such as mercurial diuretics, thiamine hydrochloride, and ergotamine tartrate. Dietary indiscretions have been claimed as provocatives by some, but denied by others.

TREATMENT

The drug of choice in the treatment of acute gout is colchicine in doses of 0.65 mg. The drug should be given in this amount at the first intimation of pain and should be repeated every two hours until the attack has been greatly ameliorated. Usually 10 to 15 tablets are needed, and they should be given continuously throughout the day and night. If, however, the pain persists, and nausea, vomiting, or diarrhea appear

the drug should be discontinued since these may be toxic manifestations of the drug. It may be appropriate to administer small doses of codeine at the onset of the acute attack until the colchicine has had time to become effective. If a course of colchicine fails to bring relief it should be repeated after an interval of two or three days. Acetylsalicylic acid in large doses, 3 to 6 grams a day, may be given in addition to the colchicine therapy, and is frequently of value. Barbiturates are usually necessary to assure sleep. The benefit derived from hot or cold compresses is usually of little moment. Bed rest, the forcing of fluids, and a simple bland diet are all that are needed for the acute attack. It is obvious, of course, that the joint should be moved as little as possible and measures taken to keep the bed clothes off the affected extremity.

In the treatment of asymptomatic gout, by which is meant individuals who have no outward manifestations of gout but who have abnormal uric acid blood levels, two drugs are particularly useful and these are again salicylates and colchicine. Cinchophen and neocinchophen have been widely used but are frequently accompanied by severe toxic and occasionally even fatal results. Usually from 1 to 3 tablets of colchicine a week to 1 to 2 a day is sufficient to keep these people asymptomatic. Although the present concept is that the use of alcoholic beverages and rich foods affects gout very little, clinically it would appear that patients are better off on simple foods. The restriction of foods with high uric content such as brains, pancreas, sardines, is usually practiced.

Rules of temperance usually are sufficient as far as alcoholic beverages are concerned. It is of tremendous importance that an adequate urinary output be maintained.

SUMMARY

The important features of gout have been discussed and a typical case presented. It is not as infrequent as supposed by many and should be considered in the differential diagnosis of any of the arthritides.

TABLE I

List (1)

Foods which contain a large amount (75 to 1000 mg.) of purine bodies in 100 Gm.:

Sweetbreads	Bacon	Lentils	Quail
Anchovies	Beef	Liver sausage	Rabbit
Sardines	Calf tongue	Meat soups	Sheep
Liver (calf, beef)	Carp	Partridge	Shellfish
Kidneys (beef)	Chicken soup	Perch	Squab
Brains	Codfish	Pheasant	Trout
Meat extracts	Duck	Pigeon	Turkey
Gravies	Goose	Pike	Veal
	Halibut	Pork	Venison

List (2)

Foods which contain a moderate amount (up to 75 mg.) of purine bodies in 100 Gm.:

Asparagus	Mushrooms	Whole grain bread and breadstuffs	Whole grain cereals
Bluefish	Mutton	Graham bread	Bemax
Boullion	Navy beans	Graham crackers	Bran
Cauliflower	Oatmeal	Oatmeal crackers	Bran flakes
Chicken	Oysters	Rye bread	Cracked wheat
Crab	Peas	Rye Krisp	Embo
Eel	Salmon	Whole wheat bread	Graham porridge
Finnan haddie	Shad		Grapenuts
Ham	Spinach		Krumbles
Herring	Tripe		Malt breakfast food
Kidney beans	Tuna fish		Pep Bran Flakes
Lima beans	Whitefish		Pettijohns
Lobster			Puffed wheat
			Ralston's
			Sims
			Shredded Wheat
			Wheat oats
			Wheatworth
			Whole Wheat Krumbles

List (3)

Foods which contain an insignificant amount of purine or no purine:

Beverages:	Bread and breadstuffs	Soda crackers
Carbonated	(except whole grain under list 2)	Uneda biscuit
Chocolate	Butter thins	Water rolls
Cocoa	Corn bread	White bread
Coffee	Corn stick	Zwieback
Fruit juices	French bread	
Postum	Gluten bread	
Tea	Holland rusk	

Others:

Butter	Fruits of all kinds	Nuts of all kinds	Cereals (except whole grain under list (2))
Cheese	Gelatin	Peanut Butter	Breakfast Brownies
Eggs	Milk—Buttermilk	Pies (except mincemeat)	Cornflakes
Fats of all kinds	Malted milk	Sugar and sweets	Cream of Wheat
	Condensed milk	Caviar	Farina Post toasties
			Grits, Puffed rice
			Rice flakes
			Rice Krispies
			Cornmeal yellow and white

Vitamin Concentrates

Cod liver oil

Halibut oil

Yeast

Vegetables containing an insignificant amount of purine or no purine:

Artichokes	Celery	Kohlrabi	Pumpkin
Beets	Corn	Lettuce	Sauer kraut
Broccoli	Cucumber	Okra	Stringbeans
Brussels sprouts	Dandelion greens	Parsnips	Summer squash.
Cabbage	Eggplant	Potato—Sweet	Swiss chard
Carrots	Endive	White	Tomato
			Turnips

Vegetable and cream soups:

Arrowroot	Sago
Hominy	Spaghetti
Macaroni	Tapioca
Noodles	Vermicelli

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ALLERGIC HEMATURIA DUE TO MILK REPORT OF A CASE

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AND

CYRUS JOHNSON, M. D.**

NEW ORLEANS

Hematuria associated with anaphylactoid purpura is not new or extremely rare. Allergists encounter such cases fairly often but it is unusual for the urologist to see a patient with hematuria as the only symptom. Osler,¹ in 1914, described 2 cases of Henoch's purpura, one with purpuric skin rash, urticaria, abdominal pain, and persistent hematuria, and the other with purpuric skin rash, colic, and hematuria. Albumin was found in both cases and they were diagnosed as nephritis associated with a skin rash of the erythema group. In the second case almost every urine specimen was smoky and sometimes bright red. Osler stated that months after all signs of

cutaneous symptoms have disappeared, hematuria may persist perhaps just enough to tinge the urine.

It was Eyermann², however, who demonstrated the association of allergy with the erythema and Schoenlein-Henoch groups of purpura. In 1930, Coca³ reported 2 cases of "essential" hematuria in individuals of allergic background with associated allergic symptoms. He considered these allergic in origin but this fact was not established. Rhodes,⁴ in 1937, reported a case of hematuria from the right kidney due to tetanus antitoxin and Miller,⁵ in 1939, reported a case of hematuria from the right kidney due to the ingestion of cod fish. Since then other cases of hematuria associated with allergy, with and without purpura, have been reported. Few, however, were not accompanied by purpura. Among some of the allergens mentioned are tar fumes, antitetanic and antidiphtheritic serums, fava bean, and various foods and inhalants.

The case reported is presented because it is believed that hematuria of allergic etiology, unassociated with purpura, is not frequently seen by urologists. It also serves as a reminder of the possibility of an allergic etiology after all other causes of hematuria have been eliminated, even though

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the preliminary history may not reveal an allergic background.

REPORT OF CASE

J.W.S., a white boy aged 8 years, was first seen February 27, 1945, because of bloody urine of four years' duration. There was no history of trauma, chills or fever, or any illness other than influenza one week prior to appearance of hematuria. The urine varied in color from light pink to a dark brownish smoky color. At times, he passed blood continuously and as a result became weak and dyspneic upon exertion. Frequently, he would have a frontal headache of three to four hours' duration and an occasional burning sensation on micturition associated with the severe bouts of hematuria. For two years he had had occasional pain in the legs, and nine months prior to our seeing him he had presumably had an attack of polyarthrititis. He had also had repeated attacks of epistaxis in the past and seemingly the ingestion of eggs frequently produced urticaria. His mother thought the hematuria might have been worse after the ingestion of eggs. The patient drank milk freely with nearly every meal and his mother related that he often consumed as much as a gallon a day! He had been seen by several physicians in his community during the preceding four years and repeated urinalyses had shown many red blood cells as the only abnormal finding.

Physical examination yielded essentially negative findings except for palpable cervical lymph nodes and a harsh mitral systolic murmur poorly transmitted but accentuated in the left lateral decubitus position. The blood pressure was 115/75.

The urine was cloudy and blood tinged in the first and second glasses; specific gravity 1.020, reaction acid, faint trace of albumin, no sugar. Microscopic examination showed innumerable red blood cells and 4 to 6 white blood cells per high power field. A stained smear of the sediment showed no pus or organisms. The phenolsulfonphthalein kidney function test was 55 per cent in one hour and ten minutes. Excretory urograms were normal. The red blood count was 4,000,000; white blood count 9050; hemoglobin 10.3 Gm.; eosinophils 5 per cent, neutrophils 55 per cent, and lymphocytes 40 per cent. Serological tests for syphilis were negative.

The child was hospitalized for additional study. Further urinalyses showed the urine still loaded with red blood cells; the specific gravity was 1.011; a trace of albumin; no sugar. A urine culture was negative. The nonprotein nitrogen was 37.5 mgm. per cent; carbon dioxide combining power 49.4 vol. per cent; dextrose 87; prothrombin time 100 per cent; platelet count 537,500; and sedimentation rate 26 mm. The Rumpel-Leede phenomenon was not demonstrable. Roentgenograms of the heart and lungs and an electrocardiogram were within normal limits.

Cystoscopy was performed under general anesthesia. The bladder and urethra were normal and bloody urine was seen spurting from both ureteral orifices. After these studies the parents, who lived out of town, desired to take the child home. They agreed, however, to return several weeks later for further study, especially allergy tests and reexamination of the heart.

The boy returned on June 26, 1945, with continuation of the hematuria. He had had no urticaria during the interim and appeared healthy. The urine showed many red blood cells; innumerable amorphous urate crystals; four plus hemoglobin; and a trace of albumin. Blood urea nitrogen was 16 mg. per cent. Blood studies showed a red blood count of 4,500,000; hemoglobin 13 Gm.; white blood count 15,000; eosinophils 9 per cent; neutrophils 54 per cent; lymphocytes 35 per cent; mononuclears 2 per cent; and a sedimentation rate of 13. Blood pressure was 102/64. Roentgenograms of the lungs and heart and an electrocardiogram were within normal limits. Skin tests for food allergens gave negative results.

The child was seen by Dr. Vincent J. Derbes in the section of Allergy and it was then decided to try to determine by means of an elimination diet whether or not the hematuria was due to an offending allergen. The patient was allowed to return home. The first diet to be followed was the Rowe No. 4 consisting of milk and tapioca. Because tapioca was not procurable, the first diet consisted only of milk. The mother wrote that the first three days of the milk diet greatly increased the amount of hematuria; she reported that the patient urinated "almost pure blood." His mother was then instructed to eliminate milk and all milk products from his diet.

The patient was next seen about nine months later on April 2, 1946. His mother stated that on discontinuance of the milk diet the urine gradually regained a normal appearance. When milk was eliminated from his diet, his attacks of hematuria occurred only every two to three weeks and lasted only several days, the urine being colored a faint pink; whereas when milk was included, hematuria was almost continuous and the urine was much darker in color. The child had had no fever, pain, edema or rash at any time since last seen. He was again hospitalized and put on a milk free diet.

At the time of admission the urine was normal. The blood pressure was 106/70. Although the mitral systolic murmur was still present, no evidence of carditis existed. Skin tests for food allergens were repeated and were negative.

The boy was taken out of the hospital one morning and that afternoon put on a milk diet. Whereas urine obtained that morning was clear and showed no red blood cells microscopically, before he retired that night the urine had become a brownish color. The next day a voided specimen was dark brown. The urine showed a positive reaction for

occult blood and a slight trace of albumin. Microscopic examination revealed a moderate number of red blood cells. The urine appeared to contain about 2 to 3 plus hemoglobin. The child had experienced no pain, rash, or other discomfort with the episode. The patient then went home with instructions to take no further milk.

On September 10, 1946, the child's mother said that the patient had had no hematuria unless he had received unboiled milk from outside sources. She had discovered that the child would not have hematuria if he drank boiled milk but hematuria invariably followed the ingestion of unboiled milk. This mechanism has been explained by Ratner⁶ as being due to the denaturation of the whey proteins by intensive heat with the resulting loss of their antigenic properties. The lactalbumin is coagulated by heat and therefore is not readily absorbed through the gastrointestinal tract.

A recent communication from the child's parents revealed that he drowned accidentally June 25, 1947. Until that time he had had no further hematuria, epistaxis, or pain in the legs or joints. He played hard, never became fatigued and had gained considerable weight. He had continued to drink boiled milk and only occasionally did a mild nettle rash appear.

SUMMARY

A case of allergic hematuria produced by the ingestion of unboiled milk in an 8-year-old boy is presented. Although reactions to skin tests were repeatedly negative, ingestion of unboiled milk produced hematuria and its withdrawal or the boiling of milk eliminated it. Appearance of the urine varied from pink to red and at times had a brownish color with both red blood cells and hemoglobin present. Hematuria was the only presenting symptom. A history of urticaria, epistaxis, headache and one attack of polyarthrititis, but no purpura, was obtained. In retrospect, the epistaxis may have been a purpuric manifestation. The fact that while at home on a milk free diet he had occasional, transient periods of hematuria is probably due to the fact that it is extremely difficult to eliminate unboiled milk entirely from the diet.

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OBSTRUCTIVE ESOPHAGEAL LESIONS IN GASTROINTESTINAL PRACTICE*

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NEW ORLEANS

Obstructive esophageal lesions in gastrointestinal practice among adults vary from the extreme of hysterical dysphagia to the organic lumen obliteration of neoplasia. It is dysphagia that initiates the etiologic search; meticulous survey of the swallowing derangement and related symptomatology aid in preliminary diagnostic speculation.

INCIDENCE

In a decade review of gastrointestinal studies, dysphagia, present in 852 instances, occurred in 8.2 per cent of patients. In this series esophagitis of acute and chronic systemic disease, and that related to ingested chemicals, intentional or accidental, was excluded.

Of the 852 patients, 639 (75 per cent) were of purely functional origin. Intra-esophageal disease, including roentgen demonstrable esophagospasm, was present in 170 (20 per cent). Lumen compression from extraesophageal disease was encountered in 34 (4 per cent). Deglutination derangement of neurologic origin was present in 9 patients (1 per cent).

Pertinent to this presentation are 213 cases of actual esophageal obstruction, which roughly represent 25 per cent of those studied for dysphagia. The conclusion that 75 per cent of dysphagics are functional individuals would, if not evaluated, seemingly indicate dysphagia to be

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overwhelmingly a hysteroid manifestation of minimal clinical importance.

With the presumption that esophageal obstruction, secondary to pressure from without and neurologically originating derangements of deglutination, have relation to this discussion only in the established importance of differential diagnosis, we are left with 170 cases of intraesophageal obstructive disease. Herein are included 94 (55.3 per cent) cases of esophagospasm and 34 (20 per cent) instances of neoplasm. Diverticula, 3 pharyngoesophageal, 2 mid-esophageal and 6 cardiac, represented 6.5 per cent of this group of dysphagics. Benign stricture (11.8 per cent) of undetermined etiology presented a problem in 12 instances; in 5 additional cases it was associated with a congenitally short esophagus; in 3 it was a part of scleroderma. There were 4 individuals with severe varices (2.4 per cent) which, with associated esophagitis, excited dysphagia. Three foreign body impactions (1.7 per cent) proved obstructive. We had only 2 proved instances of peptic ulceration of the esophagus (1.2 per cent) which, with related spasm, were obstructive. Syphilitic stricture and Boeck's sarcoid involving the esophageal wall, were rarities encountered, one of each.

DIAGNOSIS

Esophagoscopy, in our experience is primarily a diagnostic procedure. Differential diagnosis without confirmatory observation is rarely acceptable, because of the frequency of concomitant disease. Pathologic mucous membrane is taken for biopsy; locally applied filbrin foam seals the site, controls bleeding, and possibly further minimizes the danger of mediastinitis. In this series all neoplasias were biopsy confirmed squamous cell carcinomas; 18 additional biopsies revealed non-neoplastic tissue. Therapeutically, 4 instances of stricture and 3 of cardiospasm necessitated initial per-esophageal bouginage; the 3 foreign bodies (meat impactions) were removed through the scope; in one patient with varices these were sclerosed with sodium morrhuate.

Roentgen demonstration of the various esophageal lesions responsible for dys-

phagia would call for too extensive illustration for this type of presentation. Fluoroscopic study of esophageal function is essential, since many conditions producing dysphagia, such as paralysis, muscular weakness, or incoordination, do not produce mucosal changes. The differentiation is not as simple as often considered, but may often necessitate combined roentgenologic, endoscopic, and biopsy study to conclude that the lesion results from disruption of normal physiology. Templeton in his classic on x-ray examination of the stomach includes a thorough evaluation of roentgen esophageal study; in addition to thoroughly presented routine observation, he adds his observations on primary and tertiary peristaltic waves in relation to cardiospasm and other esophageal disease.

TREATMENT

Nonoperative management of obstructive esophageal disease is restricted to general measures to improve the mental and physical well being of the patient, dietary measures, vitamins, applicable antispasmodics, analgesics, physiotherapy, deep roentgen therapy, and bouginage.

The principal dietary instruction should be the outlining of a diet compatible with the patient's lesion in an effort to maintain oral nutrition at as near normal requirements as is possible. Excessive heat or cold, condiments, alcohol, and mucosal irritants are contraindicated. The dietary management of peptic esophagitis is that of an ulcer elsewhere. Tube feeding may be indicated in an effort to gain nutritional benefit, to maintain a lumen, and to rest the esophagus.

Amyl nitrite, nitroglycerine and aminophyllin are often effective in the relief of cardiospasm, reflex esophagospasm, and spasm associated with Plummer-Vinson syndrome. This is our confirmed observation in proved cases, but since it is contrary to the opinion of such authorities as Bockus, Ritvo and McDonald, and others, we advocate careful diagnostic study in all instances since these same drugs are effective in coronary and cholecystic spasm. The other so-called antispasmodics, including trasen-

tine, syntropan, pavatrine, trocinat, pro-fenil, octin, Abbott AP 43, have, in our clinical, roentgenologic, and bougie control series, been entirely ineffective both orally and parenterally. Atropine and its derivatives are actually contraindicated. Prostigmine and depropanex have no esophageal relaxing value.

Analgesics and sedatives have their place. Habit forming drugs are limited to emergency usage.

Vitamins have limited applicability when malnutrition has produced deficiency. Etzel would have us give thiamin as a specific measure.

Acid neutralizers relieve the pyrosis of esophagitis, especially when gastric regurgitation is the excitant.

Hyperpyrexia, local diathermy, and spinal anesthesia have poorly confirmed and largely debatable therapeutic worth in any form of esophageal disease.

The sclerosing of varices is of confirmed value.

Deep x-ray and radium therapy of esophageal neoplasms may be more than symptomatically ameliorative in lymphosarcomas, but is generally felt to be only that effective in carcinomas.

Bougienage has been practiced for over 50 years in relieving dysphagia. Passive dilatation is applicable to all cases of esophageal narrowing; active divulsion is restricted to instances of spasm and has its greatest efficiency in cardiospasm.

Steel shaft fiber bougies and mechanical divulsors used through the esophagoscope, necessarily involve a semioperative procedure; they are applicable to the preliminary management of cases in which scarring or fibrous stricturing exists. Sippy's graduated olives and those of others in various sizes and shapes attached to a fiber and guided by a swallowed thread, are introduced fearlessly by persistent adherents. Unguided semistiff woven fiber bougies in competent hands are excellent adjuncts.

Hurst introduced his mercury filled bougie in 1913. These, carried and guided through the esophagus by their weight,

open a passageway by their size. They are easily passed, cause little discomfort and are unquestionably the safest dilators available. Successively larger tubes (21 to 40 English) are passed at a single sitting. In most cases the largest meets with only slightly more resistance than the smallest in spastic disease.

Additional favorable factors in the use of Hurst bougies include: (1) In the instance of narrowing at several sites, all are dilated to the same extent by one passage. (2) Patients may be taught self bougienage. (3) No fatality has been recorded from their use. These bougies have limitations, are more satisfactory when the cardiac opening is dependent without too great sacculation, the larger sizes often prove annoying to patients because of the bulk in the pharynx.

The history of bag divulsion dates back to J. C. Russel's work of 1898. In 1906, Plummer modified Russel's instrument and introduced into prominence the rubber covered silk balloon hydrostatic pressure. Moersch and Vinson, with their excellent work and statistic accumulation, have sustained their preceptor's teachings. This instrument is a rubber tube supported by a whalebone staff tipped with an olive, just behind which is a rubber covered silk balloon which is dilated by hydrostatic pressure regulated by special adaptors. Introduction is carried out over a previously swallowed silk thread.

In 1929, Frank Smithies designed the pneumatic dilator, a modification of Plummer's apparatus. This dilator, being portable, requiring no special water supply, being devoid of whalebone staff, but having a metal shaft with safety control, and being of inexpensive construction, was a notable achievement. It rendered fluoroscopic control of divulsion dilatation practical. Its only essential distinction from the Plummer dilator, however, is that it is pneumatic.

Since September 1938, we have used a mercury pneumatic dilator. This dilator and divulsor combines the principles of Hurst, Plummer and Smithies and achieves a position of maximal efficiency and safety.

It is a No. 21 Hurst mercury tube, on the distal end of which, 7.5 cm. from the tip has been incorporated a rubber covered silk bag, 11 cm. length, to which a small catheter runs through the mercury filled tube. By this means distention, under the control of a manometer, may be effected.

The distinct advantages of this instrument are that: (1) A swallowed guiding thread is not required; it is easily passed, being the size of the small Hurst dilator. It is carried through by virtue of its contained 21 ounces of mercury sufficient to force the closed sphincter, but not weighty enough to traumatize or perforate the esophagus. (2) This type dilator is more easily passed with less discomfort than any other type, and shows less tendency to coil in a dilated prediaphragmatic esophagus due to the tendency toward rigidity in the distal six inches. (3) Only a single instrumentation is required, as contrasted to the passing of an olive prior to the use of a Plummer dilator and the use of graduated Hurst bougies. (4) It offers controlled pneumatic divulsion, which is more practical and safer than hydrostatic dilation. (5) It is applicable to fluoroscopic control.

Dilatation and divulsion rarely fail in cardiospasm or benign stricture, and the prognosis is such that one seldom considers operative procedures. Gastrostomy is merely palliative. Retrograde dilation with Tucker's instrument and divulsion manually, or by forceps from the gastric side, are major procedures reserved for those few instances in which adequate indications exist.

The surgery of dysphagia includes diverticulum resection especially applicable to the pharyngo-esophageal variety, extra-thoracic esophageal construction in complete lumen obliteration, esophagogastric plasty in some instances of cardiospasm and the esophageal resection for malignancy. Torek's achievement of a five year survival after thoracic esophagectomy for carcinoma has not been duplicated.

From the gastroenterologists' aspects surgical management is a procedure elected only when urgently indicated, extremely

dangerous when the thoracic esophagus is involved and rarely produces a result freeing the patient from the need of postsurgical endoscopy and dilatation.

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THE SHORTCOMINGS OF CERTAIN OPERATIVE PROCEDURES IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

LOUIS F. KNOEPP, M. D.

ALEXANDRIA

One might also title this presentation, "Problems Encountered in the Selection of Operations for Patients with Pulmonary Tuberculosis." What is meant more precisely is that most of the surgery for pulmonary tuberculosis is pretty well standardized today, but there are times when operations fail to accomplish what was intended of them. This is true in other fields of surgery just as much as it is in the chest. For example, gastroenterostomy is an appropriate operation for the treatment of certain peptic ulcers, but it will fail in a certain number of patients. This does not mean that anything is wrong with the gastroenterostomy or its application in any particular patient. The same is true with lesions of the lungs. Thoracoplasty has been and continues to be a most effective operation for closing tuberculous cavitation in a lung, but it will fail in this mission in a number of patients. It is most disconcerting to have a patient upon whom we have performed thoracoplasty successfully and with apparent cavity closure return to us or to another thoracic surgeon in a few years with the cavity reopened.

TENSION CAVITIES

This is the first problem we shall consider. When a patient has large cavitation, we assume it to be of the tension type. This assumption is not without foundation. These patients, to be sure, must first be bronchoscoped to determine the nature of the bronchus leading to their cavitation. If

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we find the bronchus normal, we may proceed to treat this patient in the conventional manner, and that is, of course, by doing a conventional thoracoplasty. One cannot always be sure that the bronchus is normal from purely bronchoscopic findings. Many of these cases have bronchostenosis around the corner where it cannot be demonstrated by endoscopy. We, therefore, also subject these patients to manometric studies of the cavity pressure itself. Naturally, increased bronchial pressure, as evidenced by needling such a cavity, means endobronchial pathology. Such a cavity will not close by ordinary surgical methods.

If by the above bronchoscopic findings and manometric studies we find the bronchus to a cavity to be normal, one may expect to get cavity closure with a conventional thoracoplasty. We cannot take our results for granted and must not rely solely on plain roentgenograms as they are not sufficiently convincing. One must depend on continued negative cultures by bronchial lavage and additional bronchiographic evidence that the lesion is closed. If, at the time of such investigation, one finds a cavity remaining, a problem then ensues as to further management. Although we shall not take time to discuss treatment of this type of case, further surgery resolves itself in either a revision thoracoplasty (the results of which have been generally disappointing), open cavity drainage, or lobectomy. The selection of these subsequent procedures entails a consideration of many other factors, one of which deals with how much disease the patient might have had in other portions of the lung.

If in our endoscopic studies one finds a bronchus to be diseased, it behooves one to treat that bronchus primarily before subjecting the patient to collapse. The treatment of such endobronchial disease is a subject in itself and may resolve into a preliminary course of streptomycin by nebulization or to actual cauterization of the ulcer itself. If, after such treatment, the active phase of bronchial tuberculosis has been somewhat controlled, we find evidences of a trap valve action on the cavity,

we must put a safety valve into the cavity before attempting surgical collapse. To accomplish this, we institute a Monaldi cavity drainage operation preliminary to the actual thoracoplasty. Monaldi drainage is never done after the thoracoplasty unless it was an omission on our part. Since any form of actual cavity drainage necessarily infects the surrounding field, such a drainage should be done in an area which is not accessible to the main thoracoplasty. In order to effectually release this region in the ultimate collapse, rib resection is done in this area before inserting a catheter in the cavity. The preferable location for such a procedure is, of course, anteriorly and the anterior thoracoplasty of Haight has been our choice, performing it some ten days before the Monaldi. Monaldi drainages are now supplemented by suction drainage to further effect a reduction in the size of the cavity. Such suction is maintained through the intervals during which the posterior thoracoplasty is eventually accomplished. Needless to say, the follow-up posterior thoracoplasty must be thorough in that complete rib lengths are taken, but the field of the Monaldi must not be entered. Since this area has been previously released, the cavity should be entirely free, both by the rib resection and a thorough pleurolysis. The tube can eventually be removed when bronchial closure is insured, and oftentimes one may find that the tube extrudes of its own accord after a number of weeks. We must emphasize here that the Monaldi operation by itself is almost worthless, and most internists and surgeons are now in accord that it be followed by an extensive thoracoplasty.

Other examples of tension cavity may be found in so-called pneumothorax failures. The pneumothorax in such a case may be virtually total, with the exception of the cavity itself. Needless to say, such a pneumothorax is not only worthless but deleterious inasmuch as it collapses only the good portion of the lung. Such patients frequently do poorly clinically, as evidenced by loss of appetite with continued weight loss, continued febrile bouts, both from cavity block-

age and from effusion formation, and poorly mentally from continued reports of a sputum which is positive for acid-fast bacilli. The simple expedient of reexpansion of the pneumothorax, even though the cavity still remains patent, often demonstrates an about-face on their clinical well-being and they again begin to gain weight and become afebrile. The ultimate handling of the cavity is no different than in the preceding types, and eventually resolves itself into thoracoplasty with or without a complementary Monaldi drainage.

Of passing interest is an example of tension cavity which we formerly subjected to a so-called plication procedure. We have only utilized a plication operation twice, and I must confess that we no longer use it. It was used in one case where the old type Brauer operation was performed. This type of thoracoplasty was far from successful in accomplishing satisfactory cavity closure for this patient. During the revision thoracoplasty, the pleura is entered and the lung freed from surrounding parietal structures. This is effected through a trap door incision through the upper four or five ribs posteriorly. Intercostal bundles are salvaged as they are later used in the closure. The region of the cavity is then folded manually over itself and thus pliated by at least two rows of sutures, much as one does in an intestinal inversion. The intercostal bundles, now longer, due to resected corresponding ribs, are scrolled and sutured back in place and the wound closed in the conventional manner. Although statistics are not readily available, such plication procedures have been rarely used in this country. They are technically difficult and a successful plication is hindered considerably by the induration of the diseased lobe. From the tension standpoint, one would not always expect to effect cavity closure from information available from our present knowledge. Such procedures have been largely supplanted by lobectomy which is technically easier and far more effectual.

TUBERCULOUS EMPYEMA

The patient with tuberculous empyema has been a problem for many years. Reports still reach the literature with attendant high mortality for surgical collapse in such cases. The reason for this mortality is hard to comprehend. We believe that patients with tuberculous empyema, properly managed, will carry little if any greater mortality than the average thoracoplasty. Much stress, however, lies in the preparation of that patient for such surgical collapse. This entails rigorous medical management, however, not prolonged, regulating protein intake and insuring vitamin, caloric, and fluid balance. During this period it becomes necessary to consider the empyema itself, and many clinicians have resorted to frequent aspirations to prevent absorption of the tuberculous pus. Nothing is more disappointing to a thoracic surgeon than the finding of multiple sinuses in the chest wall from such repeated needlings, frequently located in the region where the incision for the thoracoplasty is contemplated. We agree that tuberculous pus should be removed, but we prefer to remove it completely and continuously by the simple expedient of intercostal drainage by small catheter. Such catheter drainage will not result in mixed infection if connected to an underwater trap. Moreover, the catheter may be placed low anteriorly where its site will not infect the subsequent thoracoplasty. Such drainage by catheter is not only innocuous but better prepares the patient by eliminating febrile bouts that ordinarily accompany an empyema. Moreover, it is a great boon mentally to these patients to at least find out they can feel and eat better even before the start of major collapsing procedures. Streptomycin is a necessary adjunct both parenterally and within the pleural cavity. It aids in reducing the number of bacilli in the pleural wall. One then proceeds with a conventional thoracoplasty, removing long rib lengths to include the first two or three cartilages and all transverse processes. Continuous suction is maintained on the empyema drainage as it

is mandatory to obliterate every iota of pleural pocketing in such a case.

BILATERAL TUBERCULOSIS

In bilateral disease where thoracoplasty or permanent collapse is necessary on one side, we at once concern ourselves with the better side. Any such contralateral lesions which do not clear themselves promptly on bed rest must be considered for pneumothorax. Thus a temporary collapse is instituted for the better side preliminary to the surgical collapse on the worst side. Not infrequently, we become confronted with a pneumothorax failure on the better side. We must then resort to some other temporary collapsing measure, with or without streptomycin, to prepare the patient for major surgery. Consequently, one must consider adopting an extrapleural separation or possibly a pneumoperitoneum to fulfill this purpose. We are trying to give this patient one good leg to stand on before we tackle his worst lung. In so doing, postoperative spread is obviated which can be no little concern in managing these patients. Pneumoperitoneum is being used more frequently of late with gratifying results. Phrenic interruption is not used as it limits the motion of the diaphragm too seriously in a patient who has been operated upon. On one score, pneumoperitoneum is less hazardous than pneumothorax in that effusions do not usually occur. Needless to say, an effusion complicating a pneumothorax on the patient's better side can be a real problem. We lay down one maxim in utilizing temporary collapse for the better lung: it must be curable by temporary measures. It, therefore, must possess no large cavitation because permanent collapse would be thus necessary here as well. One can, however, do limited bilateral thoracoplasties. Vital capacity and spirometric determinations are a "must" in many of these. There is a certain limitation to the amount of bilateral disease any one person can have and still undergo collapsing procedures. This limitation is even more pronounced when the type of collapse is permanent. In one of our patients who was hemorrhaging at the time of admission, it was assumed

that the hemoptysis arose from his worst lung. To obviate a critical flare-up, a contralateral pneumothorax was established as we thought he had too much disease to undergo thoracoplasty on the worst side. As frequently happens with the establishment of the contralateral pneumothorax, not only did the lung clear but some of the disease on the worst side diminished. He was 68 years old incidentally, but went through his surgery without incident and ended up with repeated negative cultures. To give some interesting statistics on this type of patient, I wish to quote the results of Buxton of Ann Arbor who reported 44 bilateral cases handled thus with 83 per cent sputum conversions. There are other sizeable series: O'Brien and Tuttle reported 85 such cases with comparable results. This consideration of bilateral disease is fairly brief as the subject is huge, but I hope you will bear with me.

CASES WITH HEMORRHAGE (X-RAY NEGATIVE)

One of the big problems that confronts us not too infrequently is the patient who shows a fairly normal roentgenogram but continues to have hemoptysis. Acid fast bacilli may or may not be demonstrable in their sputa and this adds to the concern. The first rule, of course, is to bronchoscope these patients. This may show nothing, but if an ulcer is seen, the diagnosis may be made. Those who have a normal endoscopic appearance should be subjected to total bronchograms, as most frequently the site of the hemorrhage and sputum can then be found. The usual finding is bronchiectasis, either under the old thoracoplasty, or in another portion of the lung previously unsuspected.

EXTRAPLEURAL PNEUMONOLYSIS

I should like to mention a few things about extrapleural separation. This was brought to our attention earlier in this presentation in bilateral cases where intrapleural pneumothorax was not successful. When the operation was first introduced some years ago, we did not know into what the indications would eventually resolve themselves, or the outcome of the procedure. Now we emphasize that the lesions

treated by such an operation must be temporary in nature, or curable by temporary means. It may be used as a preliminary operation when another more permanent type of collapse is anticipated. Usually in the latter case, the pneumonolysis is followed by a thoracoplasty. It can either be done anteriorly or posteriorly, with or without rib removal, or even replacing the rib. The indications for such a procedure, of course, must be necessarily limited as one could ordinarily perform such a thoracoplasty primarily. One of the chief indications for this operation is the control of hemorrhage where conventional pneumothorax cannot be done. It produces instant collapse of the bleeding portion of the lung and affords a better risk patient for the subsequent thoracoplasty. Naturally, we cannot do the thoracoplasty to stop the bleeding, since it is a staged procedure and the patient may bleed to death before a sufficient number of stages are completed.

Formerly some of these pneumonolyses were followed by instillation of a foreign substance to make them permanent. Paraffin was one of these, but muscle, fat, oil, and special gauzes have been used. It is well to point out the hazards of paraffin pneumonolyses, particularly when a large amount of paraffin is used. In the first place, it is a foreign body which may provoke an extrapleural effusion. The space thus formed may be the source of a chronic infection. Again, the paraffin frequently shifts its position and can no longer be trusted as an effective plomage agent for the underlying disease. These patients will probably come to eventual thoracoplasty, which in retrospect, one could have done primarily. Small paraffin fillings in selected cases sometimes continue to do well, but the agent is not entirely innocuous of foreign body reaction, and therefore, not ideal. Recently, plastic materials have been used but conclusions cannot yet be drawn.

The defeat of extrapleural pneumothorax, or filling the space with air refills, lay in the inability to reexpand many of these lungs. Such an extrapleural space when maintained over a period of years, must

eventually become the seat of chronic infection and a thoracoplasty eventually follows. The rib removal in such a case must be necessarily delayed until all signs of infection have been controlled.

CONCLUSIONS

There are a number of additional problems which one encounters in this field which have not yet been considered due to the limitation of time. One of these is the consideration of primary lobectomy for the treatment of tuberculosis of the lungs. Pulmonary resection has a promising outlook in carefully selected patients. The subject is complex and quite large, consequently we cannot give it due respect today. Then there is the problem of the tuberculoma, basal tuberculosis, the proper utilizing of phrenic nerve interruption, and extensive intrapleural pneumonolysis.

In summing up, let us merely state that results from the surgery of tuberculosis of the lungs can be quite gratifying if one studies the patient from all available sources of investigation. A properly applied operation will therefore give good results when it is known what is to be expected of the procedure.

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PROLAPSE OF GASTRIC MUCOSA INTO THE DUODENUM*

CASE REPORT AND ANALYSIS OF REPORTED CASES

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A cursory review of the literature pertinent to the prolapse of gastric mucosa into the duodenum reveals a varied attitude toward this condition and numerous methods of treatment. Many clinicians and roentgenologists have believed this to be a mere curiosity often seen incidental to the routine barium examination of the gastrointestinal tract and not the primary pathologic lesion occasioning the examination.

An increasing body of evidence, however, tends to show that this is not the case

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and that prolapsed gastric mucosa may give rise to a symptom complex which may be disabling to the patient and for which a definite course of treatment is indicated. An analysis of the literature discloses a total of 33 cases of prolapsed gastric mucosa proved at operation, to which we have added the 34th. The first case reported by Von Schmiden¹ in 1911 was followed in rapid succession by others. (Table I). Four additional cases attributed to French³ and 6 other cases reported by Ira A. Ferguson, but not published, and therefore not available for analysis, bring the total to date to 44 cases. Over 100 cases are reported as noted on x-rays but not confirmed by surgery, and therefore, are not included in this report.

This condition has been found and proved by surgery in only 1 case in Charity Hospital at New Orleans in over 500,000 admissions since 1937. We feel that this does not represent the true incidence of this condition, and that it may be a common cause of epigastric distress and a potential source of obscure gastrointestinal tract bleeding overlooked by the radiologist or ignored by the clinician.

Scott,¹¹ who has done rather extensive investigative work on this problem, feels that this condition is more than a mere roentgenographic variant and should be considered a clinical entity. However, considerable controversy still exists. How much importance should be attached to this condition remains unanswered. Bockus¹⁷ believes that only severe prolapses associated with gastritis can cause symptoms and then only after producing partial pyloric obstruction. Alvarez states that the roentgenological appearance of prolapsed gastric mucosa has no significance and does not explain the symptoms. Impetus for further consideration of this condition is provided by A. Melamed⁴ of Milwaukee, who demonstrated 25 cases so diagnosed in which the patients were relieved of symptoms following medical or surgical care. Others have pointed out the dangers of overlooking some associated pathology, e.g., ulcers, tumors, and carcinomas.

The roentgen signs produced by this condition were first described by Eliason, Pendergass, and Wright in 1926.¹⁵ Feldman^{18, 11, 5} and others report an incidence of redundant gastric mucosa in approximately 0.1 per cent of all gastrointestinal cases, and which is not recognized as such until the mucosa prolapses into the pyloric canal, and presents a characteristic mushroom appearance in the first portion of the duodenum. Scott¹¹ feels that prolapses are overlooked for three reasons: (1) The examiner is not thinking of them; (2) filling defects produced are confused with ulcer or duodenitis; and (3) when recognized, no clinical importance is attached to them.

At operation² the prolapsed portion of gastric mucosa appears like a loose collar of redundant hypertrophied mucosa. The prolapsed folds may appear as normal mucosa, soft and pliable, and not fixed, or the mucosa may be thickened as in chronic gastritis. Studies of the normal gastric antrum reveal the mucosa and muscularis to be connected by soft, yielding submucosa composed of loose areolar tissue containing blood vessels, lymphatics, and nerves. Scott, in studying over 100 autopsy specimens, demonstrated the mucosa to be movable over a distance of 1 to 1½ inches. Normal mobility of this range is apparently not enough to permit a prolapse.

Studies of associated disturbed physiology of the stomach, as determined by gastric acidity, fail to show any correlation. Gastric acidity from 0 Free and \pm 13 total, to 75 free and 90 total is reported. Gastric motility as demonstrated under fluoroscopy with a barium meal also varied with the degree of pyloric obstruction present.

The history of symptoms ranged from several weeks to ten or more years and from mild to severe. The more consistent complaints were those of epigastric distress aggravated by taking of food, especially solids, epigastric fullness, and in severe prolapses nausea and vomiting, probably indicating varying degrees of pyloric obstruction. A symptom reported in several cases,^{10, 12} and the primary complaint in our

TABLE I

Author	Year	Age	Sex	Symptoms	Duration	Hemorrhage	X-Ray	Acidity	Operation	Pathology	Result
Von Schmieden	1911	27	F	Vomiting and epigastric pain	7 Months	None	Irregularity of pylorus	Normal	Excision of mucosa	Fold of mucosa inflamed	"Cure"
Ellison, and Wright	1925	56	M	Not stated	Not stated	None	Prolapsed mucosa	Not stated	Gastrostomy	Prolapsed mucosa	Not stated
Ellison,	1926	61	M	Epigastric cramps	5 months	None	Constant defect of duodenum	Not stated	Gastroenterostomy, excision of prolapsed mucosa	Prolapsed mucosa	No follow-up
Pendergass, and Wright	1926	29	M	Indigestion	Not stated	None	Constant defect of duodenum	Not stated	Gastroenterostomy, excision of prolapsed mucosa	Prolapsed mucosa	"Healed"
Meyer and Singer	1931	42	M	Indigestion and vomiting	2 months	None	Irregularity of pyloric area	0 Free	Resection mucosa	Chronic gastritis	Well 3 months later
Pendergass and Andrews	1935	70	M	Indigestion	15 years	None	Prolapsed mucosa	Normal	Excision mucosa, gastroenterostomy	Redundant mucosa, Ulcer post. wall	Improved, no follow-up
Pendergass and Andrews	1935	37	F	Indigestion	1 year	None	Prolapsed mucosa	30 Free 86 Total	Excision of mucosa	Prolapsed mucosa	Well 4 years later
Pendergass and Andrews	1937	46	M	Indigestion	5 years	Two bouts hematemesis	Filling defect pylorus	45 Free 60 Total	Pyloroplasty	Redundant mucosa	Recurrence symptoms 2 years
Rees	1937	53	F	R.U.Q. pain, fullness	5 years	None	Mucosal pouching 6 hr. residue	Not reported	Closure pylorus, Gastroenterostomy	Prolapse mucosa	Unimproved
Rees	1937	43	F	R.U.Q. pain, fullness	Years	None	Prolapse, No retention	Not stated	Section pylorus, excision mucosa	Prolapse mucosa	Well. Follow-up not stated
Rees	1937	33	M	Vomiting	3 months	None	Mucosal prolapse	Not stated	Excision mucosa,	Prolapse mucosa	Well. Follow-up not stated
Boher and Copleman	1937	57	M	Pain, vomiting hematemesis	20 years	Hematemesis 15 years	Prolapse, No retention	Not stated	Excision mucosa, Horsley pyloroplasty	Prolapse mucosa	Died 4 months, septicemia
Archer and Cooper	1939	29	F	Indigestion, epigastric distress	11 years	Hematemesis, melena, anemia	Prolapse mucosa	32 Free 42 Total	Pyloroplasty	Prolapse, tight pylorus	Relieved when discharged
Archer and Cooper	1939	27	M	Epigastric pain, vomiting	Not stated	None	Prolapse mucosa	Not stated	Hollick-Mikulicz pyloroplasty	Prolapse mucosa	Relieved when discharged
Archer and Cooper	1939	51	M	Tarry stools, weakness, anemia	2 years	Melena	Negative	Not stated	Pyloroplasty	Prolapse, tight mucosa	Recurrence of hemorrhages
Archer and Cooper	1939	58	M	Indigestion hemorrhages	3 years	Hematemesis, melena	Prolapse, old gastroenterostomy	Not stated	Horsley pyloroplasty	Healed ulcer, prolapse	Small hemorrhage 6 months later
Melamed and Hiller	1943	39	F	Fainting, weakness	3 months	Melena	Filling defect antrum	Not stated	Excision mucosa	Hypertrophy, healed ulcers	Well 1 month later
Norgore and Shuler	1945	61	F	Epigastric pain	1 year	None	Prolapse mucosa	75 Free 90 Total	Gastric resection	Chronic gastritis, prolapse	Died 4 months Post. stomach normal

Author	Year	Age	Sex	Symptoms	Duration	Hemorrhage	X-Ray	Acidity	Operation	Pathology	Result
Norgare and Shuler	1945	42	M	Epigastric pain	2 years	None	Healed ulcer, prolapse	60 Free 85 Total	Gastric resection	Gastritis, prolapse with obstruction	Well at discharge
Scott	1946	25	M	Indigestion, epigastric pain	19 months	Occult blood	Deformed bulb	11 Free 27 Total	Resection mucosa Finney pyloroplasty	Normal mucosa	Well 1 year later
Scott	1946	41	M	Epigastric pain	2 years	Occult blood	Prolapse mucosa	0 Free 13 Total	Resection mucosa, Heineke-Mikulicz pyloroplasty	Prolapsed mucosa	Well 1 year later
Scott	1946	34	M	Indigestion, epigastric pain	2 years	Occult blood	Protruding mucosa	Normal	Resection mucosa, Heineke-Mikulicz pyloroplasty	Prolapsed mucosa	Well 1 year later
Scott	1946	31	M	Epigastric pain	5 months	Hematemesis 500 cc.	Prolapse mucosa	34 Free	Resection mucosa, Heineke-Mikulicz pyloroplasty	Prolapsed mucosa	Well 6 months later
Mackenzie, MacLeod, Bouchard	1946	29	M	Fullness, Indigestion	20 months	None	Filling defect	Normal	Resection mucosa, Heineke-Mikulicz pyloroplasty	Prolapsed mucosa	No follow-up
Mackenzie, MacLeod, Bouchard	1946	48	M	Epigastric pain, ulcer healed	Not stated	None	Narrowing prepyloric region	0 Free 30 Total	Resection mucosa, Heineke-Mikulicz pyloroplasty	Simple inflammation	No follow-up
Appleby	1947	64	F	Weight loss, Indigestion	10 years	Anemia, occult blood	Prolapse	0 Free 56 Total	Gastric resection	Gastritis, superficial ulcer	Well until dead 3 years later
Appleby	1947	52	M	Weight loss, Indigestion	7 years	None	Pyloric obst., old gastro-enterostomy	60 Free 78 Total	Gastric resection	Edema, prolapse	Well 13 years
Appleby	1947	44	F	Epigastric pain, vomiting, weight loss	Years	None	Prolapse mucosa	40 Free 70 Total	Gastric resection	Edema, prolapse	No follow-up
Appleby	1947	57	F	Cramping pain, fullness, wt. loss	8 years	None	Prolapse mucosa	2 Free 33 Total	Gastric resection	Gastritis, prolapse	Well 5 years later
Appleby	1947	65	F	Fullness, pain, weight loss, indigestion	3 years	None	Prolapse, retention	0 Free 60 Total	Gastric resection	Prolapse	Well 3 years later
Appleby	1947	43	M	Fullness, weight loss, epigastric distress	Years	None	Prolapse	14 Free 65 Total	Gastric resection	Prolapse, mucosa	Objectively normal 10 months
Judd and Moe	1947	53	M	Fullness, indigestion	18 months	None	Obstructing lesion	0 Free 6 Total	Gastric resection	Prolapse, gastritis	Well at discharge
Nygard and Levitan	1948	45	M	Indigestion	13 years	Hematemesis	Prolapse	0 Free 15 Total	Gastric resection	Chronic gastritis, healed erosion, gastritis	Well 1 month later
DiLeo, Kuker, and Shepard	1948	65	F	Epigastric pain, indigestion	2 years	Hematemesis, melena	Prolapse, duodenal diverticulum	Not stated	Excision mucosa	Prolapse, chronic gastritis	Well 6 months later

case,—that of hematemesis with secondary anemia,—seems to be an important finding.

CASE REPORT

M. R., 65 year old colored female, was admitted to Charity Hospital on December 1, 1947, with the chief complaint of having vomited about 500 cc. of coffee ground material the day before admission and later of passing several tarry stools. Further questioning revealed that she had intermittent attacks of epigastric pain, indigestion, and occasional attacks of nausea and vomiting for the past two years. Total weight loss 40 lbs.; however, her local physician had placed her on a low caloric diet for hypertension.

Physical examination revealed blood pressure of 160/80 mm. Hg. The mucous membranes were pale. An aortic systolic murmur was noted. Examination of the abdomen was essentially normal. Rectal examination revealed black stool on the examining finger, which gave a 4 plus benzidine test for blood. Pelvic examination negative. Multiple pigmented nevi scattered over body.

Laboratory studies: Hemoglobin 6.5 Grams; R.B.C. 2.5 million; W.B.C. 3,555; Polys. 60, Monocytes 6, Lymphocytes 34; Hematocrit 19. Urinalysis normal. Blood chemistry studies normal. Kline and Kolmer negative.

G. I. Series: (December 1, 1947.) No definite abnormalities demonstrated under fluoroscopy. The films demonstrate prolapse of gastric mucosa into the duodenum. (Fig. 1) A diverticulum is noted in the region of the junction of the second and third portion of the duodenum. No gastric retention.

The patient was placed on a high caloric, high protein diet supplemented with vitamins, ferrous sulfate, and given a total of 1500 cc. of whole blood during the preoperative period, raising the hematocrit to 38 mm. On December 23, 1947, the patient was taken to surgery and under ethylene-oxygen-ether general anesthesia an exploratory procedure was performed through an upper right rectus muscle splitting incision. The liver, spleen, cecal, and pelvic regions presented no abnormalities. The stomach appeared and felt normal except for a boggy mass in the pyloric region, extending into the first portion of the duodenum. No other masses were palpable nor was the pyloric region fixed by any infiltrating growth. The stomach was brought into the field and opened by a 2" longitudinal incision in the prepyloric region. An Allis forceps was introduced through the pylorus and a mass of redundant prolapsed mucosa brought into view. This was resected in a circumferential manner and sutured, using an atraumatic chromic 00 continuous lock stitch suture, including an occasional bite into the deeper layers. The gastrotomy opening was then closed in a transverse manner with a double row of continuous chromic 00 atraumatic catgut and a seroserosal layer of interrupted sutures of quilting cotton. No attempt was made



Figure 1. Preoperative gastrointestinal series showing prolapsed gastric mucosa into the duodenal cap (indicated by arrow) presenting a mushroom appearance with a central streak as described by Eliason, Pendergass, and Wright.

to remove the diverticulum in the duodenum. The abdomen was closed in anatomical layers, using catgut technic.

The pathologist's report of the specimen: Tissue received in formalin measuring 7 x 3 cm. and 0.3 to 0.1 cm. thick. Mucosal surface wrinkled, smooth, and yellow. Serosal surface ragged and red. Microscopic diagnosis chronic gastritis.

Postoperative course was uneventful and the patient was discharged on the fourteenth postoperative day. A gastrointestinal series done on January 13, 1948, revealed no abnormality of the esophagus, stomach, or duodenum. (Fig. 2) The diverticulum is again noted.

Postoperative follow-up at four months: Patient had felt well since surgery, had been completely relieved of epigastric symptoms, and was eating a regular diet without difficulty. At six months follow-up she had gained 15 pounds in weight and was completely asymptomatic. A repeat gastrointestinal series again revealed the stomach and duodenum to be normal except for the diverticulum previously reported.

It is our impression that since the patient has remained entirely asymptomatic following surgery,

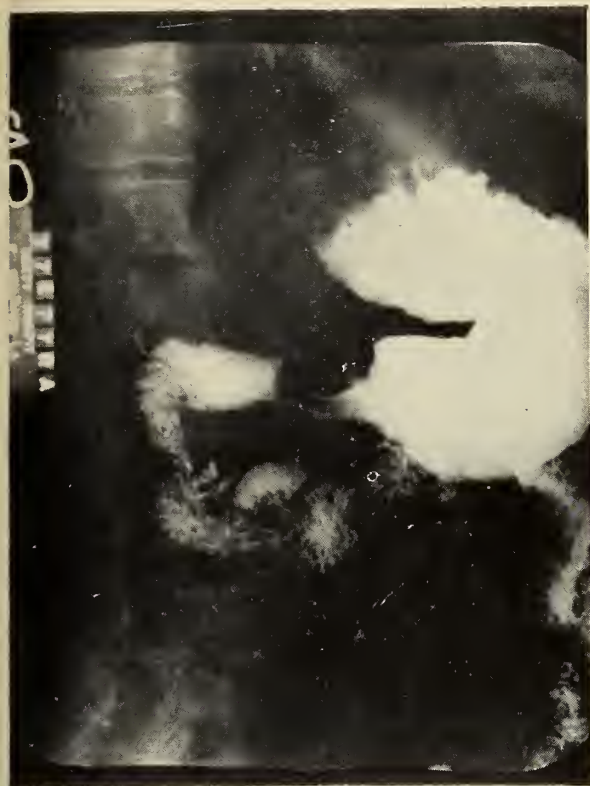


Figure 2. Postoperative gastrointestinal series reported by radiologists as normal filling of stomach, pylorus, and duodenal cap. No evidence of previous defect.

the diverticulum reported in the third portion of the duodenum was probably not the cause of her complaint.

ETIOLOGY

The etiology of this condition is unknown. However, several theories have been offered.^{2, 4, 6} The most attractive explanation to us is that there is first developed a hypertrophic gastritis with large redundant rugae in the prepyloric portion. These are gradually forced toward the pylorus by peristalsis, with resultant increased mobility of the submucous layer, until finally a fold is pushed through the pylorus into the duodenum. Symptoms are due to the partial block thus produced and the trauma to the mucosa causes superficial erosions which may bleed.

SYMPTOMS

The symptoms usually noted are epigastric pain (56 per cent) and indigestion (47.2 per cent). This has been described as being increased rather than diminished

TABLE II

SYMPTOM	NUMBER	PER CENT
Epigastric pain	19	56.0
Indigestion	16	47.2
Gastrointestinal bleeding	13	38.2
Weight loss	6	17.2
Vomiting	5	14.7
Epigastric fullness	5	14.7
Weakness	2	6.0

by ingestion of food.^{3, 8} Gastrointestinal bleeding as noted by hematemesis, melena, or persistent occult blood in the stools was found in 38.2 per cent. We consider this finding significant, and feel that every case of unexplained gastrointestinal bleeding should be investigated from this standpoint.⁸ Symptoms of less constant occurrence are weight loss (17.2 per cent), vomiting (14.7 per cent), epigastric fullness (14.7 per cent), and weakness (6 per cent). Weight loss has been particularly emphasized by Appleby⁶ and Norgore and Schuler.³ As is apparent, these symptoms are non-specific and may be imitated by a variety of upper abdominal diseases. Diagnosis, therefore, depends on roentgenological examination. In the collected cases a definite mucosal prolapse on x-ray was observed in 22 cases (64.7 per cent), and in all but one some type of prepyloric or bulb deformity was noted. It should be emphasized that retention is not necessary for the roentgenological diagnosis⁹ and that simple prolapse cannot with certainty be differentiated from prolapsing tumors and malignancy.^{4, 10} The symptoms are chronic and are apparently allowed to persist for some time before the patient seeks medical advice. In the reported cases 20 out of 27 waited more than one year from onset of symptoms before presenting themselves to their physicians.

TABLE III

DURATION OF SYMPTOMS	
Less than 1 year	7 cases
Over 1 year	20 cases
Average duration	51 months

PHYSICAL AND LABORATORY FINDINGS

The physical findings are not usually noteworthy. Localized tenderness is sometimes observed and there may be evidence of recent weight loss or anemia. Prolapse seems to be found more commonly in the

TABLE IV
AGE INCIDENCE

Decade	No. Cases
20-30	6
30-40	5
40-50	9
50-60	8
Average Age	45.8 years

older age groups, the majority of cases occurring in the fifth and sixth decades. (Table IV.) The average age in this group was 45.8 year. Laboratory findings may demonstrate a mild or moderately severe anemia. The gastric analysis usually shows a normal acidity. (Table V.) There is a

TABLE V
ACIDITY

Normal	13 cases
Hyperacidity	6 cases
Hypoacidity	3 cases
Not indicated	12 cases

slight predilection for the male sex, there being 22 males and 12 females in the reported cases.

DIAGNOSIS

We believe that patients who have suffered abdominal distress in whom prolapsed gastric mucosa can be demonstrated and who fail to respond to a brief trial of medical management should have an exploratory laparotomy. This view is supported by several facts to which Bockus¹⁷ calls attention by saying, "When complete prolapse into the duodenum occurs, the differentiation between pedunculated tumor and prolapsing gastric mucosa will often be impossible and operation may be necessary. If there is a large defect in the pyloric canal and a negative shadow in the duodenal bulb, the condition may not be distinguishable from that of pyloric ulcer, hypertrophic gastritis, or carcinoma." This difficulty in diagnosis ^{4, 10, 14} has been clearly demonstrated in two case reports, one by Melamed¹ in 1933, which presented a large ulcer in the prolapsed mucosa, and another report by Rubin,⁹¹ in which the resected specimen revealed malignant change. Further evidence in favor of surgical management is the excellent results reported by Scott¹¹ on 5 cases with complete relief of symptoms and no recurrence on a full diet.

The types of operation (Table VI and

TABLE VI

Procedure	Cases	Good Results	Poor Results	Not Followed
Excision of mucosa and pyloroplasty	7	4	1	2
Gastric resection	10	8	1	1
Excision of redundant mucosa	6	6	..	..
Gastrotomy	1	..	..	1
Excision of mucosa, gastroenterostomy	3	1	..	2
Pyloroplasty	5	2	3	..
Closure pylorus, gastroenterostomy	1	..	1	..
Section of pylorus, excision mucosa	1	1	..	..

Table I) used for this condition range from simple resection of the mucosa to gastroenterostomy and in some cases gastric resection. It is our opinion that the various procedures used all have certain merits which cannot be challenged, and that time and an increasing number of reported cases alone will permit a more adequate evaluation.

It is our opinion that abnormalities of this type should be reported by the roentgenologist, letting the further treatment rest with the clinician. A fair trial of medical management is indicated in all but the obstructed bleeding or suspected malignancy cases. Next it seems fitting and proper to perform the simplest surgical procedure that will give good results. Here we must depend on the judgment of the individual surgeon. If at the time of exploration gastric mucosal prolapse alone is found, simple excision and suture will suffice. If the mucosa is ulcerated or presents a tumor, a frozen section should be followed immediately by a gastric resection if malignancy exists.

SUMMARY AND CONCLUSIONS

1. Thirty-four cases of prolapsed gastric mucosa have been collected from the literature and reviewed, including one not previously reported. Only cases without tumor formation and proved at operation were used.

2. It is believed that this condition is more common than is reported and that it may be a cause of unexplained gastroin-

testinal bleeding. The symptoms are not diagnostic and the diagnosis must be made by x-ray. Retention is not necessary for roentgenological diagnosis.

3. Operation should be considered in patients with prolapsed gastric mucosa, who have upper abdominal complaints or gastro-intestinal bleeding and who fail to respond promptly on brief medical therapy. Good results may be expected from surgery.

4. After gastrotomy is done to determine the nature of the lesion (and this should be done even when the pylorus is normal to palpation), the treatment of choice is either simple excision of the mucosa with or without pyloroplasty, or gastric resection.

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THE TREATMENT OF HEAVY METAL POISONING WITH BRITISH ANTI-LEWISITE (BAL)*

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HISTORICAL

No medical research developed during World War II has opened more fields of possible study than has that on the compound 2, 3-dimercaptopropanol (British antilewisite, BAL). It was developed by Peters and his associates¹ during the war years as an antidote to the arsenical blister gases. Its original use was a local one and intended to counteract superficial contamination of the cutaneous areas and of the mucous membranes of the eyes. Subsequent research found it to be most effective in combating systemic sequelae of arsenic poisoning, from exposure to both arsenical gases and ingested and injected arsenicals, taken therapeutically or as a poison. It has since been used as a prophylactic agent to prevent complications, or arsenic poisoning, when arsenicals are used medicinally as in syphilotherapy. The results in large series of the last type of cases indicate that many of the serious complications of arsenotherapy may be greatly reduced by the use of BAL when administered early and in proper amounts, intramuscularly.

BAL has since been used in cases of acute poisoning from various other metals. The results in acute mercury poisoning, as well as in gold poisoning, have been most encouraging. The studies of BAL begun at Oxford by Stockton, Thompson, Peters¹ and their associates have been carried on and developed in the United States since 1941.

EXPERIMENTAL

The study of the action of BAL has resulted in an important advance in the understanding of fundamental biologic mechanisms. BAL is unstable to heat and acids and decomposes during distillation.

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The toxicity of trivalent arsenicals is largely due to their binding of essential thiol groups in enzyme proteins. This concept was supported by the significant observation that dithiols of the BAL type not only prevented the inhibition of enzyme systems by arsenicals but also reactivated these enzyme systems when added after inhibition had occurred. From the extensive research of various investigators,² here and abroad, on the effect of trivalent arsenicals, chiefly lewisite, on enzyme reactions concerned with cellular metabolism, it is concluded that trivalent arsenicals exert their toxic action by combinations with S. H. groups of the activating protein of enzyme systems. Tissue respiration is interfered with by the action of the arsenicals on the large groups of S. H. enzymes essential for carbohydrate transformation and fat metabolism. The enzyme inhibitions produced by lewisite and arsenic as well as certain other metals, can generally be prevented by BAL or other closely related dithiols.

BAL is a strong reducing agent and is rapidly oxidized in the presence of catalytic amounts of copper and hemin. BAL destroys the physiologic activity of insulin. These reactions of BAL may be associated with the toxicity of the compound when injected in large amounts.

TOXICITY

BAL is not an innocuous substance; Peters and his associates¹ observed profound toxic effects. The striking physiologic and metabolic changes of BAL poisoning are not accompanied by comparable morphologic alterations. Little is to be seen grossly or microscopically, other than congestion of the viscera and occasionally, accumulation of fluid in the serous cavities or lungs^{3, 4}. Lesions of the central nervous system have been described following the injection of certain BAL derivatives.³ In man, solutions or ointments containing 5 to 10 per cent BAL produce only temporary lacrimation, blepharospasm and eye pain, when instilled into the conjunctival sac^{4, 5}. Injected intramuscularly in sterile peanut oil and benzyl benzoate

solution, concentrations of BAL of 10 per cent or less are well tolerated.⁶⁻⁹ Inunction of a total of 1 cc. of undiluted BAL or of 2 gm. in a jelly base does not produce systemic effects in man.⁸⁻¹⁰

CLINICAL USAGE

Working with the S. H. containing enzyme succinioxidase, it has been shown that heavy metals such as lead, antimony, bismuth, cadmium, mercury, and zinc produce complete inhibition and that the enzyme is reactivated on the addition of certain BAL derivatives. This demonstrates that the toxicity of these metals is like that of arsenic, due to the inhibition of the S. H. group. These studies indicate that there is need for experimentation designed to test the therapeutic value of BAL in these heavy metal intoxications. Subsequent clinical studies have added to the knowledge of drug intoxications which are greatly helped by BAL therapy; among these are gold and tellurium.

The most extensive investigation of the clinical value of BAL has been in arsenic poisoning and its complications. The largest series in this group has been reported by Eagle and co-workers and a summary of the findings in his 200 cases is included herein.

TABLE I

SUMMARY OF 200 CASES OF ARSENICAL POISONING TREATED WITH BAL (Eagle)

1. *Arsenical dermatitis*: In 88 cases, 80 per cent responded to treatment.
2. *Toxic encephalitis*: In 55 patients, 44 recovered completely within one to seven days and 11 died.
3. *Agranulocytosis*: In 11 cases, 10 recovered with 1 death.
4. *Aplastic anemia*: In 3 cases, there was no beneficial effect from BAL.
5. *Jaundice*: In 14 patients, 5 showed prompt response, 7 evidenced no effect, and in 2 the effects were debatable.
6. *Massive overdosage of mapharsen*: In 4 cases there were 3 with prompt improvement and 1 death.
7. *Arsenical fever*: There were 44 cases with prompt recovery in all.

REPORT OF CASES

A group of 18 cases of arsenical intoxication in adults seen at Charity Hospital of Louisiana at New Orleans has been summarized and is reported. Serious compli-

TABLE II

ARSENICAL POISONING IN ADULTS TREATED WITH BAL

Diagnosis	Age of Patient	Race	Sex	Total Dosage	Immediate Reactions and Comment	Complications
Arsenic Poisoning (Ingestion)	19	W	Female	16.2 cc.	Response good	Disappearance of severe nausea after first Rx.
Arsenic Poisoning (Ingestion)	42	W	Male	27 cc.	After 1st dose of BAL complained of: 1. Local pain. 2. Generalized weakness. 3. Headache-nausea. 4. Profuse sweating. 5. Burning sensation mouth and throat.	Symptoms began 3-5 minutes following ingestion.
Arsenic Poisoning	16	W	Female	16 cc.	None—good.	None.
Arsenic Poisoning (ant poison)	18	C	Female	2 cc.	No reactions.	None.
Arsenic Poisoning (sodium arsenite mistake)	45	W	Male	12 cc.	No reactions. Response good.	None.
Arsenic Poisoning acute	24	C	Female	24.5 cc.	No reactions. Response good.	None.
Arsenic Poisoning subclinical	26	W	Male	6.6 cc.	None—good.	None.
Acute Arsenic Poisoning (ant poison)	67	W	Female	45 cc.	No immediate reaction. Response good.	None.
Arsenical Dermatitis	60	C	Male	20 cc.	Fever end of fifth day.	Fever-abscess.
Arsenical Dermatitis	41	C	Female	34 cc.	No untoward reaction. Good results.	None.
Arsenical Dermatitis	38	C	Male	34 cc.	Remarkable improvement on BAL.	None.
Arsenical Dermatitis	43	C	Male	39 cc.	Good results.	Complained of headache during BAL administration.
Arsenical Dermatitis	36	C	Male	164 cc.	Good response.	None.
Arsenical Dermatitis	43	C	Female	38 cc.	Almost immediate loss of periorbital edema; rash rapidly subsided.	None.
Arsenical Dermatitis	62	W	Male	30 cc.	Good response.	None.
Arsenical Dermatitis	46	C	Male	40 cc.	Good response.	None.
Arsenical Sensitivity	28	C	Female	18 cc.	Patient ran fever 105° F. after arsenical therapy.	Temperature gradually receded to normal after BAL injections.
Acute Arsenic Poisoning (ingestion)	19	W	Female	12 cc.	Patient took ant poison, had severe vomiting, diarrhea and albuminuria.	Disappearance of symptoms by third day.

cations were conspicuous by their absence. The rapid response in all these cases was striking.

Norman C. Woody and John Kometani¹¹ recently read a paper at the Annual Meeting of the American Academy of Pediatrics, Dallas, Texas, December 1947, on BAL in the treatment of arsenical ingestion in children. The same authors also published a paper on the subject in the *New Orleans Medical and Surgical Journal*. These excellent papers showed that BAL is an effective chemical antidote for arsenic poisoning. The side effects in their series were not serious. These authors made recommendations concerning the application of BAL in the treatment of one of the most common and serious pediatric emergencies.

The prophylactic use of BAL in preventing reactions in intensive arsenotherapy when other antisyphilitic drugs cannot be used offers a new field of usefulness for this new drug.

Local applications of BAL ointment are of value either as a supplement to BAL injections, or in those patients in whom systemic BAL administration is contraindicated because of its severe side effects in such conditions as hypertension, and heart disease.

BAL properly administered is effective in the treatment of patients with arsenical encephalitis and in individuals who have received a massive overdose of mapharsen¹². BAL is probably of value in some cases of *blood dyscrasia* resulting from arsenotherapy and it appears to be of little if any value in most cases of so-called arsenical jaundice¹³.

GOLD POISONING

Preliminary experiments on rats have shown that the compound formed by the union of BAL with gold is nontoxic. In 5 cases, twenty-four hour urine specimens showed definite increase in the excretion of gold after BAL treatment was begun. In 4 patients with eruptions of less than two months' duration there was prompt cessation of pruritis and the rash cleared within a month. The fifth patient who had had an extensive eruption for three months

before BAL therapy did not respond to treatment. Presumably this patient was treated after the toxic changes produced by the gold had become irreversible, since the urinary excretion of the gold was equal to or greater than that found in patients showing satisfactory clinical response.

BAL is effective against both toxic and allergic manifestations due to gold. Toxic reactions to gold injections in doses used in rheumatoid arthritis are reported by Cohen, Goldman and Dubbs,¹⁴ as occurring in 25 to 56 per cent of cases. I do not encounter many toxic reaction to gold injections in our skin clinics or in my private practice. This great incidence and variation in reactions encountered by many following gold injections is hard to understand. Perhaps the use of smaller doses, 5 to 50 mgms., once weekly, for a total dosage of about 765 mgm. would decrease the incidence of the gold reactions. Occasional sensitivity manifestations occur despite all precautions.

POISONING FROM OTHER HEAVY METALS

In mercury poisoning, as was anticipated from preceding animal experiments, the results in treating these cases with BAL have been most encouraging¹⁵. The absence of clinical reports in bismuth poisoning is surprising since bismuth is in such general use today. The bizarre manifestations of bismuth intoxication and the difficulty in diagnosing it probably account for the absence of information on the use of BAL in bismuth poisoning. The use of BAL in cadmium and antimony poisoning has been favorably reported on. Further studies will probably add new usage for BAL as the drug is still a relatively new one.

DOSAGE

Experiments showed the necessity for further studies in animals in regard to toxicity and therapeutic effectiveness of BAL in various vehicles, routes of administration, and dosage schedules.¹⁶ The data so obtained made possible the development of a stable sterile preparation of BAL in benzyl benzoate-peanut oil solution, suitable for intramuscular injection. The most effective method of treatment was found to

consist of four injections of BAL at two to four hour intervals, followed by a single daily injection for six days. On this schedule, BAL in doses of 1 to 10 mgm. per kg. per injection saved 55 per cent of the animals from repeated massive doses of mapharsen and delayed death in an additional 22 per cent. The toxicity of this preparation on intramuscular injection in man was then carefully investigated. The result of these studies on dosage are as follows.

DOSAGE OF BAL

The dosage of BAL is 2.5 mg. to 3 mg. per kilogram of body weight, 10 per cent in oil, to be given intramuscularly every four hours for the first few days, five injections on the third day, and two injections, daily, thereafter for ten days, or until recovery.

REACTIONS AND COMPLICATIONS

It has been shown that BAL in oil injected intramuscularly, at a dosage level of 3 mgm. per kg. produces only the mildest reactions in a small percentage of the individuals tested.⁶ If, however, the level is increased to 5 mgm. per kg. more than half the subjects experience some or all of the following reactions: nausea, vomiting, headaches, generalized aches and pains, burning sensations in the mouth, nose and eyes, sweating, restlessness, weakness, pain in limbs, jaws and trunk muscles. The heart rate is often increased, and there may be a rise in both systolic and diastolic blood pressure.⁶⁻⁸ These signs and symptoms are transient and subside within four hours. Care should be exercised when BAL is given to patients suspected of impaired liver action. The pressure of severe renal disease does not appear to be a contraindication of BAL.

Prevention of reaction to BAL as given by Murray Tye and John M. Seigel¹⁷ was beneficial. Because of the close resemblance of severe symptoms caused by BAL therapy to those seen in patients with serum sensitivity, an injection of 0.6 cc. of a 1:1000 solution of epinephrine hydrochloride was given to a patient with arsenical dermatitis and hepatitis. Rapid and complete relief resulted when an injection of 25 mg. ephedrine sulphate was given orally

before each ten subsequent injections of BAL, and no toxic symptoms occurred. A second patient was given 25 mg. ephedrine sulphate orally and had no toxic symptoms until the seventh injection when ephedrine was omitted. In a few minutes the patient noted severe lacrimation, headache, constriction of the chest, and a burning sensation of the side of the trunk. Subsequent injections of BAL were preceded by the administration of 50 mg. ephedrine and no further toxic symptoms were experienced. This is of eminent value when BAL therapy is imperative.

Kennedy and Henington¹⁸ have reported a case in which the patient survived an accidental intravenous injection of an oil solution of BAL. BAL is a relatively safe drug. Most reactions are mild, and of short duration, and usually consist of profound weakness, nausea, vomiting, headache, muscular aches, lacrimation, and salivation.

SUMMARY

Experimental and clinical results have been presented which prove that BAL is of definite value in the systemic treatment of various types of metal poisoning, particularly arsenic, gold, mercury, and antimony. The mortality and complications of poisoning from these metals are greatly reduced and recovery is greatly accelerated. The results obtained emphasize the importance of prompt and adequate treatment.

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THE LOCAL INJECTION OF PENICILLIN IN ACUTE CIRCUMSCRIBED INFECTIONS

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Direct local injection of penicillin is an effective and economical method of administering this therapeutic agent in acute localized infections caused by organisms sensitive to this antibiotic. To date, penicillin has proved to be the most effective agent against staphylococcal infections. It may be given intravenously, intramuscularly, applied topically or injected directly into an infected area: In 1948¹⁰ we reported this method of treatment in over 300 cases of acute localized infections in various parts of the body. The results obtained were so highly satisfactory that it seems

worth while to direct further attention to this method of treatment. The regional injection of penicillin in acute localized infections is not new: Florey¹, Cutler², Rose and Hurwitz³, Peck⁴, Sophian⁵, Fisher⁶, Kaplan and Rabin¹⁰, and others, have employed this technic with excellent results. This work was initiated in 1943 on a septic surgical ward of an army regional hospital, and continued on the surgical out-patient services of Touro Infirmary and of Charity Hospital of Louisiana at New Orleans.

The purpose of this report is to record the observations and results obtained by the regional injection of penicillin in over 400 cases of acute localized infections in various parts of the body.

Acute infections may be divided for practical purposes into two clinical types: ⁷⁻¹⁰ (1) acute infections which do not cause death of tissue, such as septicemia and cellulitis; and (2) acute infections causing suppuration and death of tissue, as seen in boils and carbuncles. In the absence of suppuration or death of tissue, acute infections are superficial and spread over a wide area, relatively unconfined by a wall of inflammatory tissue. In contrast, where suppuration and death of tissue have occurred, a localized area of gangrene is surrounded by a zone of granulation tissue which separates the living from the dead tissue and which circumscribes the infection and prevents its spread, but which also acts as a barrier to free circulation into the diseased area. Because of these differences, the response to any form of therapy is not the same in these two types of acute infection.

It has been shown that the results of parenteral therapy with penicillin may vary considerably in the two types of acute infection. The results in acute infections in which there is no death of tissue are quite dramatic, while in acute localized infections, with suppuration, the results are not only less dramatic but at times even discouraging. If penicillin therapy is to be effective, the infecting organisms must be susceptible to the antibiotic, and adequate concentration of the drug must be obtained

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in the tissue in which the bacteria are imbedded. Because of the impenetrable inflammatory barrier surrounding a localized area of gangrene, circulation to this area is impaired and penicillin, when given parenterally, does not reach the diseased areas in sufficient concentration to be of any value.

Penicillin has several properties that give it distinct value as an antibacterial agent for local application. It is active against most of the organisms responsible for acute local infections. It is active in high dilutions. It is not inhibited by exudates, and it is nontoxic when given either locally or parenterally.

In view of these facts, it seemed to us that the most suitable method of administration of penicillin in acute localized infections should be direct injection into the infected area. By this means a high concentration and a deep, even distribution of the drug at the point where it was needed could be assured. The injections should be repeated often enough to ensure prolonged contact, thereby killing or inhibiting the growth of bacteria, so that the natural defenses of the body could complete the rest of the destruction and proceed with the process of repair.

METHOD OF TREATMENT

Three cubic centimeters of distilled water or 1 per cent novacain are injected into the bottle containing 100,000 units of penicillin, making a dilution of approximately 33,000 units to the cubic centimeter. The size of the lesion determines the amount of the solution to be injected. Too much tension in the infected area may break down the barriers that the body has set up to localize the infection and must be avoided. This is a matter of judgment. Small lesions require 0.5 to 1 cc. at each injection, while larger ones, such as a carbuncle, may require 4 cc., or even more. The required amount is aspirated from the bottle containing the solution and the remainder kept in the ice box for the injection on the following day, as the potency of refrigerated penicillin in solution is maintained for approximately twenty-four hours.

The injection is made with a 24-gauge hypodermic needle into the most dependent area of the abscess. Without entirely removing the needle, the operator makes several injections into different areas of the lesion in order to insure an even distribution of the drug. Usually spontaneous evacuation of pus occurs during the injection, depending upon the stage of the infection. If the abscess is superficial and pointing, this occurs practically all the time. In cases in which the abscesses are fluctuant, they are aspirated with a larger needle immediately before the injection of the penicillin solution. In carbuncles the injections are made between the areas of pointing and the needle is usually inserted deeper than in the localized abscesses.

Following the injection a dry sterile dressing is applied. For several reasons it is desirable to keep the infected area closed. (1) This keeps the penicillin solution in contact with the infecting organisms. (2) It is important to obtain as high a concentration as possible in the diseased area, for in the early stages of infection there are some strains of staphylococci which are resistant to low concentrations of penicillin but are susceptible to the higher concentrations. (3) The danger of infection of the wound by secondary invaders which may produce penicillinase is minimized.

The injections are usually quite painful, the degree of pain varying with the density of the tissues and the volume of the fluid injected. However, the pain does not persist more than 4 to 6 hours.

Some increased redness is usually noted on the day following the injection. At that time another injection is made in the same manner as the first. On the third day the degree of resolution noted is quite surprising.

In about one-fifth of the furuncles only one injection was necessary; the others required two. Most were entirely healed on fourth day. The carbuncles required three, and occasionally four, injections, and were healed on the tenth day. In a large number of abscesses there was complete absorption without any external drainage.

RESULTS

Carbuncles: There were 60 carbuncles in this series; 21 on the posterior aspect of the neck, 28 on the upper back, 4 on the buttocks, 1 on the right anterior lateral abdominal wall, and 3 on the thighs, 1 on the chin, and 3 on the anterior chest wall. Three of these patients were severe diabetics. The average number of injections given on successive days was three. The average number of days required for healing was ten.

These results are in marked contrast to those observed following surgical procedures. An average of forty-three days was required for healing following incision and drainage in a series recently reported by Maes and Herringman^{8, 9}. Extremely gratifying, in addition to the rapid healing time, was the cosmetic result obtained. There was practically no loss of skin and there were no deforming scars, as seen following surgical intervention.

A short control series was run in this group. Two patients with carbuncles on the neck were given 30,000 units of penicillin parenterally every three hours for seven days. At the end of this period both patients still had large carbuncles with many areas of drainage. It was six weeks following incision and drainage before healing took place. Two carbuncles on the back of the neck were injected locally with 100,000 units of penicillin in 3 cc. of distilled water daily for three days. In addition, 30,000 units of penicillin were administered intramuscularly every three hours for ten days. The response was dramatic. The carbuncles seemed fairly to melt away and were entirely healed in ten days. Two carbuncles, one on the back of the neck, the other on the buttocks, were treated solely by local injection of 100,000 units of penicillin in 3 cc. of distilled water daily for three days. The results were equally as good as in the group which had been given penicillin parenterally as well as locally. In the two patients who received penicillin parenterally only, it is doubtful that the drug reached the infected areas in sufficient concentration to be of any definite value. Because of the inflammatory barriers sur-

rounding the infection and the lack of circulation to the necrotic center, the antibiotic could not be expected to reach the bacteria imbedded in the slough and sterilize it. In contrast to the difficulty and expense of the maintenance of a high concentration of penicillin by parenteral administration over a period of many days or weeks, local injections offer a suitable and efficient alternative.

Furuncles: Furuncles formed the largest group in this series of cases. Eighty-four per cent responded favorably to this form of therapy; 17 per cent required incision and drainage.

Breast Abscesses: Two abscesses of the breast were seen. They were both superficial, located near the nipple, and fluctuant. They were aspirated and injected with 60,000 units of penicillin in 2 cc. of distilled water on two successive days. Both were healed on the fifth day.

Axillary Furunculosis: There were 15 cases of axillary furunculosis. Ten patients had multiple lesions. All responded favorably and there were no recurrent "crops" as often seen following incision and drainage. The average time for healing, following two successive injections, was five days.

Cellulitis: While a fairly large number of cellulitides were seen, only a few were treated by local injections and this procedure was soon discontinued. These infections are superficial and not well localized. Any increased tension in them will cause the infection to spread. This happened in one of our patients when we first began this form of therapy. A young man was seen with an area of cellulitis measuring approximately 5 x 6 cm. on the ventral aspect of the right upper forearm. The area was injected locally with 60,000 units of penicillin in 2 cc. of distilled water. The following day the area of inflammation had spread to an alarming proportion. He was admitted to the hospital and, with the administration of penicillin intramuscularly, the lesion cleared in a short time. This type of infection responds rapidly to parenteral therapy and should be so treated.

CONTRAINDICATIONS

Local injection of penicillin is not recommended in infections in the dangerous areas of the face, in cellulitides, and in bone felons.

COMMENT

It is not the purpose of this report to leave the impression that this form of therapy should be used in all types of acute localized infections. It should be reserved for the more serious ones and for the lesions so located that surgical procedures may produce a bad cosmetic result. It is useful when surgical intervention has proved to be inadequate. In well localized infections that are fluctuant, simple aspiration or incision and drainage are the procedures of choice. Surgical judgment should be exercised in each individual case.

SUMMARY AND CONCLUSION

1. The technic and the results of the local injection of penicillin in acute circumscribed areas of infection in over 400 ambulatory patients are presented.
2. Experience with this method of local therapy with penicillin has demonstrated that it is safe, effective, and economical. There were no complications.
3. Because of the impermeable inflammatory barrier surrounding an acute localized infection, penicillin, when given parenterally, may not reach a sufficient concentration in the affected area for therapeutic effectiveness.
4. By local injection it is possible to reach a concentration in the infected area far in excess of the highest levels obtained by intramuscular administration.
5. Following injection directly into the affected tissue, there is almost immediate improvement and recovery is established in a few days.
6. Extremely gratifying, in addition to the rapid healing time, is the cosmetic result obtained. There is practically no loss of skin and no deforming scars are seen as are usually found following surgical intervention.
7. This procedure is not recommended for the treatment of the cellulitides, for in-

fections in the dangerous areas of the face, or for bone felons.

8. Surgical judgment must be exercised in each individual case.

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THE MANAGEMENT OF PREMATURE LABOR

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NEW ORLEANS

If any single disease accounted for half of all adult deaths, it would receive extended scientific study and enormous lay as well as professional publicity. Yet premature labor which terminates between 5 and 10 per cent of all pregnancies and is associated with about half of all neonatal deaths receives little more than casual attention. Certainly no one can say that these infants are of negligible value in our civilization, for history has left us records of premature babies who have made their famous marks on the world¹. How many more with names as celebrated as Charles

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Darwin, Victor Hugo, Voltaire and Winston Churchill might there be if more premature had lived.

The most logical solution to the problem of the premature labor is to avoid it. For this very good reason many studies of the causes of premature labor have appeared²⁻⁸. (A review of the literature up to 1939 was published by Anderson and Lyon⁹). Toxemia, maternal uterine bleeding, multiple pregnancy and so-called "normal" premature labor are the common causes. Syphilis as well as other acute and chronic infections are of lesser importance. The gravest danger comes when several etiologic factors are active at the same time, e.g., bleeding plus toxemia plus syphilis. But we must be realistic and admit that little is known about prevention of bleeding and toxemia of pregnancy. Until these diseases are prevented, the incidence of prematurity will inevitably remain high. Tyson² has recently called attention to the fact that the incidence of premature birth in the Philadelphia Lying-In Hospital has remained essentially unchanged for fifteen years at an average of 9.4 per cent. This does not imply that premature labor cannot be prevented, for such important measures as careful prenatal care and adequate nutrition will diminish prematurity¹⁰⁻¹². Nevertheless, at the present state of our obstetric development at least half of all premature labor is inevitable.

Although there has been a distinct decrease in the mortality of premature babies in recent years, a glance at vital statistics will show that most of the improvement has occurred in those babies who lived more than forty-eight hours. In general it is correct to say that deaths within the first forty-eight hours of life are of obstetric origin, while those after forty-eight hours are of pediatric origin. This does not necessarily imply culpability of the obstetrician. There is an inevitable and irreducible mortality of early life because of congenital maldevelopments and unpreventable immaturity. Nevertheless it is clear that many of the deaths without apparent cause, incorrectly ascribed to prematurity,

can be prevented by proper obstetric management.

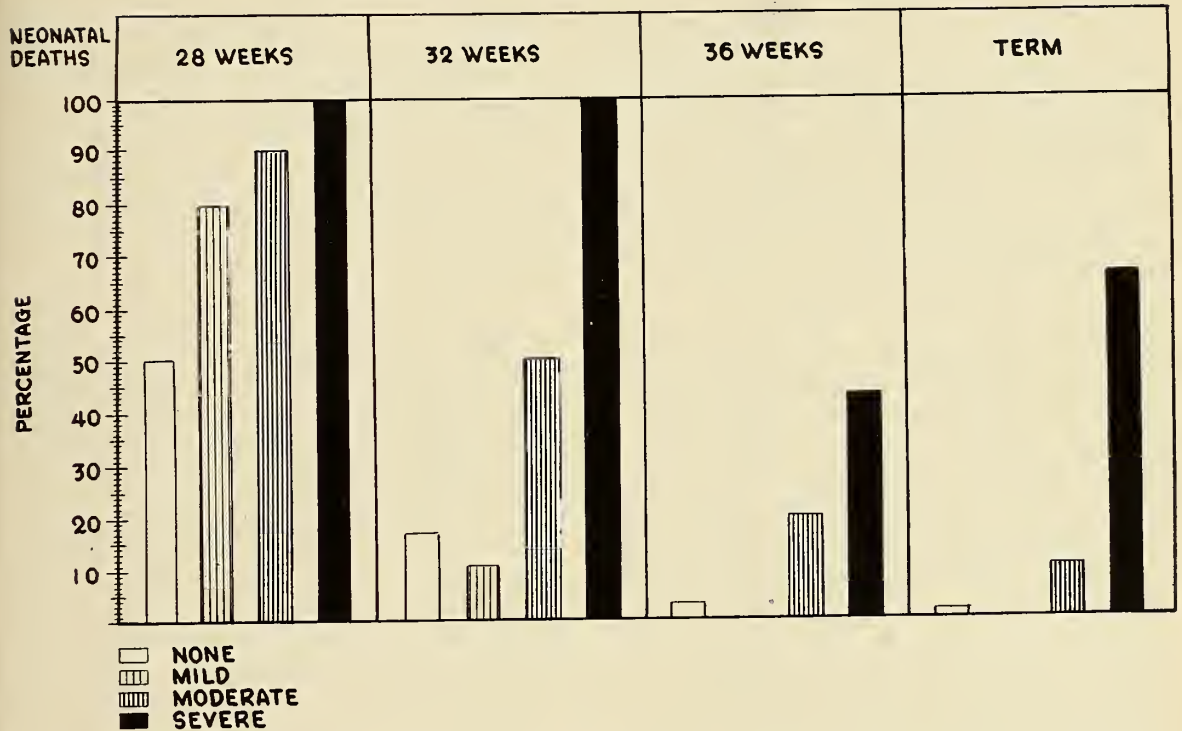
In many respects the anatomic and physiologic differences between the premature and mature infant are as great as those between the newly born mature infant and the adult. Herein lies some of our failure. Although the premature infant has many anatomic and physiologic handicaps,¹⁴ a thorough understanding of four of these is essential in obstetrics.

I. RESPIRATORY HANDICAPS

Several systems are at fault in this respiratory derangement. In the first place there is an anatomic immaturity. The alveoli of the lung are lined by a layer of cuboidal epithelial cells which separate the air of the alveolar space from the capillary endothelium. (The recent work of Joesslyn indicates that in the mature individual the capillaries lie uncovered in the alveolar space.) Capillaries are infrequently seen. Furthermore there is little elastic tissue in the framework of the lungs as compared with the mature infant.¹⁵ Physiologic immaturity is shown by the incompetent nervous control of respiration. Levine¹⁴ exposed normal full term infants to an atmosphere containing 1.5 per cent carbon dioxide which caused a pronounced stimulation of respiration; premature infants similarly exposed were unaffected. Not until the concentration of carbon dioxide exceeded 4 per cent was stimulation of respiration observed. The paucity of capillaries in the brain may be responsible for the low reactivity of the respiratory center. The cough and gag reflexes are extremely weak, and the infant often makes little or no effort to overcome respiratory obstructions. Finally, the weakness of the muscles and bones of the thoracic cage combined with the lack of elastic fibers of the lung favors the maintenance of low intrathoracic negative pressure and atelectasis.

It is necessary for the obstetrician to manage properly this handicap. The part played by neonatal asphyxia is of major importance. There is an unbroken chain of events between pain relieving drugs and neonatal death. Premature infants tol-

ASPHYXIA AND NEONATAL MORTALITY OF VARIOUS GESTATIONAL AGES



erate analgesic agents very badly. Neonatal asphyxia is more than doubled if the mother receives analgesics. Figure 1 shows the direct relation between the degree of neonatal asphyxia and neonatal deaths. Skillful use of pain-relieving drugs produces little serious asphyxia of the mature infant, but there is no place for these drugs in premature labor, however skillfully they may be given.¹⁶ Many infants have been sacrificed because large or repeated doses of morphine or barbiturates were given in the vain hope of halting an inevitable premature labor. This, these drugs cannot do.

Local and regional anesthesia have much to offer in the proper conduct of premature labor. It is advisable to restrict the use of inhalation anesthesia at the time of delivery to small amount of the milder agents, such as nitrous oxide or ethylene, with plenty of oxygen.¹⁷ Deep ether anesthesia is definitely contraindicated. Sometimes an argument against restriction of analgesics is raised by physicians who say that the patient demands it. Never have I found a mother who would not willingly accept

such restrictions when the reasons were explained to her by the physician during the labor. If, in spite of preventive methods, the infant is asphyxiated at birth, proper treatment is essential. Above all, be gentle. All forms of violent resuscitation cannot be condemned too greatly; these include the Schultze swinging, jack-knifing, cold tubbing, anal dilatation, dousing with ether, cuffing and slapping. Even holding the infant by the heels may be dangerous if anoxia is great, for the fragile capillaries of the brain are easily ruptured. If intubation of the trachea is necessary, it may be accomplished by passing a small tube under direct vision with the aid of a small laryngoscope or by tactile intubation. Most clinicians favor visual intubation, as the tactile method is not only difficult but also dangerous because of the small larynx and fragility of the mucosa and underlying structures.

Oxygen should be administered to every premature infant immediately after birth. It should be given whether or not there is visible cyanosis. The use of a carbon di-

oxide-oxygen mixture is advised by some men of note; many others favor the use of oxygen alone. To be efficient, the mixture would need to contain at least 5 per cent carbon dioxide, as premature infants are refractory to lower concentrations. Furthermore such a concentration of carbon dioxide would be too toxic for prolonged use, but it might be applied for short periods of time during the neonatal period to stimulate respirations.

II. TISSUE HANDICAPS

It is not necessary to discuss at length the obvious significance of immaturity and fragility of tissues. The state of the respiratory system just described is a part of this handicap. The brain, however, must have special mention. The gaping fontanelles and suture lines expose the brain to direct trauma, and intracranial hemorrhage is a serious complication in these infants.

The physician must diligently avoid trauma throughout labor and delivery. If induction of labor is necessary, it should be by medical means. Breese¹⁸ found that surgical induction of labor was attended with a 42 per cent mortality as against 28 per cent for the medical method.

Once labor is established, oxytocics must never be used; sudden and explosive labors are dangerous for the infant. When for any reason the membranes remain unruptured, their integrity should be maintained as long as possible, even during the second stage of labor, as they cushion the head against the impact of pelvic soft parts.

There is an erroneous belief that cesarean section, being atraumatic to the fetus, offers the best chance for survival. Such is not the case. Clifford's¹⁹ experiences, as well as our own, emphasize the poor results of cesarean section. The reasons for this are not entirely clear. The part played by general anesthesia in some of these deaths must not be overlooked. Breech delivery is equally dangerous. Beck²⁰ has called attention to the disproportionally large head of the premature infant, and suggests that the after-coming head is always delivered through a cervix incompletely dilated by

the trunk and shoulders. The safest method is the vertex delivery from below with episiotomy when indicated. Some¹⁹ have reported slightly better results with outlet forceps than with the spontaneous delivery. This might be a good plan in skilled hands especially when rigidity of the perineum in a primiparous patient causes delay in delivery; however, its value will be lost if a general anesthesia is a part of the procedure.

III. CIRCULATORY HANDICAPS

These are primarily hemorrhage and anemia. The fragility of the capillaries and the reduced prothrombin level may combine to produce excessive bleeding. Several factors produce capillary fragility; one common but often overlooked cause is anoxia. Anoxia in turn produces capillary hemorrhages in the lungs, adrenals, thymus and brain—hemorrhages which readily may prove fatal. A deficiency of elastic tissue about the small blood vessels makes them susceptible to minor degrees of trauma.

The anoxia may be qualitative, quantitative or both. Even though adequate numbers of erythrocytes are present at birth, many are of the nucleated type and are inefficient carriers of oxygen. Furthermore a serious anemia appears rapidly during the early neonatal period because of a deficiency of iron. These anemias are amenable to iron and to blood transfusions. In order to provide the maximum amount of hemoglobin and fluid to the premature infant, who will surely need them, it is advisable to delay clamping the umbilical cord until all pulsations have ceased. Further attention to the anemia becomes a part of neonatal care.

IV. METABOLIC HANDICAPS

Two metabolic handicaps of major importance concern this discussion. The first is birth weight. No single factor exerts greater influence on mortality than does the birth weight. No other pound can ever be as important to the life of the premature infant as the fourth one. For example, an infant who weighs 3 pounds has but one chance in four of survival, while an infant of 4 pounds has three chances in four.

There is but one way to increase birth weight: to prolong gestation. The importance of proper prenatal care, diet, and prompt attention to complications of pregnancy have been discussed.

At times premature labor must be induced for reasons of the mother's health. Immediately the obstetrician faces a two-fold dilemma: Shall he induce labor at the risk of the child for the sake of the mother or postpone delivery for the sake of the child but at the risk of the mother? The second, and probably more difficult question, concerns the survival of the infant *in utero*. Shall he interrupt a pregnancy at the risk of prematurity to save the fetus from possible, if not probable, death? This problem is not uncommon in toxemias of pregnancy especially in the hypertensive type.

The solution is not easy. Careful abdominal palpation augmented by roentgen studies will usually give a valuable estimate of the infant's weight. Careful and conservative management of most complications will permit some extension of the time of gestation. A delay of two or three weeks may increase the weight of the baby as much as a pound. Of course such delay must not be unduly hazardous for the mother.

The second important point concerns the inability to control body temperature. This erratic temperature control comes from an inability to regulate heat production as well as heat loss. Levine¹⁴ accounts for the low heat production by the lack of crying and muscular activity. Heat loss is excessive because of the large surface area of the premature infant in relation to weight and the lack of insulation—the subcutaneous fat. Finally the incomplete development of the nervous system, including the hypothalamus, may also derange temperature control.

The obstetrician plays an important part in the problem of temperature control which begins at the moment of birth. If the infant becomes chilled, immediately a drop in temperature follows. Ylppo²¹ as well as others showed that the mortality of

1500-2000 gm. infants during the first five days of life was 8.6 per cent when the initial temperature was above 91.4° F as against 24.3 per cent in those below 91.4° F initially.

As soon as the cord ceases pulsating, it should be cut. Immediately the infant should be placed in a portable preheated incubator. At this time, and not before, the cord should be tied, mucus removed from the respiratory passages, and resuscitation given if necessary. During these procedures the infant should be exposed as little as possible, and oxygen should be given continuously. The infant in the incubator can then be moved to the nursery where constant attention of trained personnel is necessary and vital. Unless the infant can be weighed safely and with dispatch, such procedures can well be postponed until forty-eight or more hours have elapsed. Knowledge of the infant's weight does not add to the chances of survival, and the procedure may be hazardous. In fact, no value is gained, but the curiosity of the relatives, the physician, and the statistician is satisfied.

SUMMARY

The most logical solution to the problem of premature labor is to avoid it. Yet many of the diseases, such as toxemia, uterine bleeding, and multiple pregnancy which produce premature labor are as yet unpreventable. Certain causes of premature labor, such as syphilis and poor nutrition can and must be eliminated by proper prenatal care. Even with the best of care the incidence of premature labor will be distressingly high. It is essential then that premature labor be managed properly, keeping in mind four important physiological handicaps of the premature infant.

Respiratory handicaps. The anatomical and physiological respiratory handicaps are great and a high incidence of asphyxia neonatorum results. Pain relieving agents of all types are contraindicated because of respiratory depression. Morphine should not be used in an attempt to halt established premature labor. If anesthesia is necessary, it should be local or regional. All

violent efforts of resuscitation are dangerous. Resuscitation, when needed, should be by careful intubation. Continuous administration of oxygen is most desirable.

Tissue handicaps. Brain injury is common because of the fragile skull. Therefore membranes should be kept intact as long as possible. Medical induction of labor is safer than surgical induction. Oxytocics must never be used once labor is established. Spontaneous or low forceps vertex delivery is safer than any other method of delivery including cesarean section.

Circulatory handicaps. A qualitative or quantitative anemia is common. Therefore the cord should not be clamped until pulsations cease.

Metabolic handicaps. Birth weight is probably the most important factor which determines the mortality rate. The most important pound in life is the fourth because survival increases from 25 per cent to 75 per cent. Often it is possible to delay induction of premature labor to allow an increase in weight. The obstetrician must not allow the baby to become chilled at the time of delivery. Usually it is possible to have a pre-warmed incubator in the delivery unit. The premature infant need not be weighed immediately as this adds another unnecessary hazard. Careful attention to these principles will reduce premature mortality by one half.

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DISCUSSION

Dr. Myron E. Wegman (New Orleans): The high mortality rate of erythroblastosis fetalis and the development of methods for estimating the amount of antibody in the mother's serum have led to the proposal that erythroblastosis in the infant might be prevented by premature delivery by Cesarean section. It should be pointed out, however, that, in general, the risk of prematurity is greater than that from erythroblastosis. When one adds to this the risks of a section it appears preferable to wait until one has reasonable assurance of a fair sized baby and then to induce delivery from below. I should like to ask Dr. King and Dr. Lund to comment on this.

One other point is in regard to the advantages of replacement transfusion. Diamond and his group believe that this procedure is the treatment of choice because when one is properly set up, it is simpler than repeated transfusions and because it appears to shorten the hospital stay. On the other hand, replacement transfusion does not appear to lower the overall mortality rate from the disease.

Dr. E. L. King (New Orleans): I think our experience will substantiate that view. We have done six or eight sections for erythroblastosis just with that idea of getting the baby into the world earlier and getting it out of the unfavorable environment of an increase in titer and our results have not been satisfactory. We did not save any large number of babies in that way. We have felt that it

is better or at least just as well to let the patient go on to term and be prepared for a replacement transfusion as soon as it arrives if the condition is sufficiently serious and if not sufficiently serious, transfuse in the ordinary way as many times as may be necessary. Another thing that makes us take this attitude is that it is very difficult to correlate the antibody titer with the condition of the baby at birth. We have had some babies that have given considerable worry whose mothers had no antibodies, or some for only two or three weeks before the babies were born and still the babies have given us some difficulty. In other cases there was a considerable titer of antibodies in the mother's blood, still the babies were all right and required very little care. We have had, of course, one or two where the baby died in the uterus before delivery. I doubt if this could have been prevented by Cesarean section. One of those was a hydrops type of baby which would have been lost and we did lose one hydrops baby by Cesarean section.

Dr. Lund (In conclusion): What do you think of episiotomy for a seven and eight pound baby and for a four pound baby?

The question of episiotomy has come up in the handling of premature babies. I do not think we need to talk about episiotomy in the larger baby; that is almost like asking a person about his re-

ligion. However, the importance of episiotomy in small babies should not be underestimated. We know, for example, that in the primiparous patient with a fairly rigid perineum a small premature baby pounding against such soft tissues may suffer serious damage, especially in the brain. Some people have gone so far as to say that all premature babies should be delivered not only with benefit of episiotomy but also with low forceps and they have the results to back them up. I think, however, that if a general anesthetic becomes a part of the procedure, then certainly any advantage is lost. the multiparous patient who delivers readily need not have an episiotomy.

Obviously, at the present time we have no specific method of preventing premature labor. I would like to call your attention to such nonspecific things as diet. For example, some of the recent work shows that mothers who have adequate diet throughout their gestation have far less premature labor than others. Careful attention and adequate care of mild pre-eclampsia will keep it as mild pre-eclampsia rather than allow severe pre-eclampsia or eclampsia to develop. So the problem is not merely a specific one of injecting hormones, which has been suggested. The use of large doses of estrogens and progesterone have not been satisfactory in our hands.

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THE IMPACT OF STATE MEDICINE ON THE PATIENT

Our patients should know how State Medicine will affect them. The most penetrating influence the medical profession can exercise against State Medicine is what each physician tells his patient. What the patient needs to know is how it will affect his life as an individual. The fact that the doctor feels an antagonism to being regimented is a novel and interesting concept to the patient but arouses no aggressive attitude in the patient.

Three places where the problem bears on

the patient should be rubbed until they shine.

First, State Medicine will not be free. The cost will be met by an additional tax of 2 per cent or more on income paid both by employer and employees. As the actual expense is much more than the official estimates, this will soon be a 5 or 6 per cent tax on each. The first six months in England cost approximately 60 per cent more than was provided in the plan. That portion paid by the employer must still come out of earnings, or the firm could not remain solvent. We may anticipate then a 10 per cent tax on earnings. Dependable figures show that at present 4½ per cent of the family income goes to pay for medical care. The result, therefore, will be that free medicine under these conditions, without regard to quality, will cost the average family with an income of \$3600 a year about \$360, while now it costs \$180. In New Zealand, where political medicine was set up less than ten years ago, the expense today absorbs 40 per cent of all revenues collected by the government, and deficit financing has been resorted to in a desperate attempt to furnish the benefits promised. Forty per cent of the comparable revenues of the United States would exceed \$15,000,000,000 a year!

The second place where this Utopian planning rubs the patient is explained by Lenin's statement that in any Socialistic state socialized medicine is the keystone of the Communistic arch. There are now 15,830,899 persons paid each month by the Federal Treasury. Compulsory insurance will require 1 clerk for each 100 insured, or 1,400,000 bureaucrats. That means 17,500,000 votes on the Federal payroll. The winning party in the November 1948 election needed only 24,000,000. In such a situation State Medicine under any name would be an easy preliminary to nationalization of banks, utilities, mines, and transportation.

The third and most important aspect to present to the patient is the fact that socialized medicine will produce stagnation in the system that has made American

medicine the best there is. Those physicians who reflect on the matter know that bureaucratic domination will affect the quality of care. Others outside of the profession have studied the matter statistically. Noteworthy among these is the Research Council for Economic Security, Chicago; the result of this study has been published under the title of "Health of Nations." It is seen here that the system of paying for medical care does not in itself appear to play a major role in the health of the nation. This is based on such health indices as infant mortality, male life expectancy at birth, and death rates from selected causes. Studies were made in the records of countries having compulsory sickness insurance, including France, Eng-

land, and New Zealand. These were compared with countries using the private fee for services system—which were the United States, Canada, and Australia. The study indicates, as might have been expected, that advancement will come by developing and expanding medical facilities, eliminating economic and racial handicaps, and by paying more attention to living standards, nutrition, and other such factors.

When the politician intervenes, the doctor-patient relationship suffers. When the incentive to do good medicine is removed, service becomes perfunctory, cold, and unadjusted to the individual. When alertness, consideration, and initiative are subordinated to routine the delicate flower of medicine withers.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

SPECIAL MEETING

The special meeting of the State Society, called by the President, Dr. M. D. Hargrove, and held in Alexandria on February 20, was attended by a large group of physicians, their wives and lay people interested in combatting compulsory health insurance legislation proposed by the present Congress. The meeting, addressed by Honorable Forest A. Harness, of Kokomo, Indiana, Dr. R. B. Robins, of Camden, Arkansas and Mr. John F. McCloskey, of New Orleans, was an interesting one and it is felt that all present were made aware of the necessity for a unified fight against this vicious legislation.

There was some discussion concerning participation or nonparticipation in a government controlled plan, should such come into existence; however, the thought was expressed that this is not a topic for decision at this time; that if the proposed legislation is defeated there will be no need for consideration in this regard.

Immediately following the general meet-

ing a luncheon was given for all in attendance. This was arranged for by the Rapides Parish Medical Society and special recognition was given members of this society for their cooperation in handling this as well as other details of arrangement for meetings during the entire day.

The House of Delegates convened at three o'clock and this meeting was open only to members of the House, members of the State Society and specified guests. The present situation in Washington was reviewed and the House of Delegates, by motion made and unanimously carried, reaffirmed the already expressed opposition of the State Society to socialized governmental, political and compulsory health insurance.

A protest sent to the AMA concerning activities of that Association in regard to the fight against socialized medicine, signed by 148 physicians, 17 of whom are members of the Louisiana State Medical Society, and also reply to this protest by the Board of Trustees of the AMA were read after which the following motion was made and car-

ried: That the House of Delegates go on record as condemning and disapproving action of these fifteen doctors of this state in signing this protest and that a copy of this action be sent to each doctor who signed the protest; also that a vote of confidence be extended the AMA and that discussion in regard to this matter be carried in the Journal. It was brought out in the discussion that it is felt doctors who signed this protest are attempting to sabotage efforts of the American Medical Association and other medical groups to defeat bills which will offer socialized medicine to the citizens of the United States.

The Chairman of the Council on Medical Service and Public Relations, Dr. A. V. Friedrichs, gave a report of the activities of the Council in an effort to have legislation calling for federalized medicine defeated, outlining what has been done and what is planned for the future in this regard.

Dr. O. B. Owens, President of the Louisiana Physicians Service, reported that representatives of the LPS have met with representatives of the Louisiana Hospital Service Association and the Hospital Service Association of New Orleans and that combination of these three plans has been considered. After discussion of this subject by Dr. Owens the following motion was made and carried: That the House of Delegates reaffirm its confidence in the Board of the LPS and instruct it to continue consultation and planning for organization of a unified statewide plan for selling voluntary insurance for both Blue Shield and Blue Cross coverage with the direction to preserve the sponsorship and vested interest of the Louisiana State Medical Society in the merger plan to be ratified by the House of Delegates as early as practical.

Dr. Guy Jones gave a report of the Committee on Rural Medical Service of which he is chairman and the following recommendation contained in the report was approved: That the Louisiana State Medical Society form a permanent committee to work with communities, make surveys and recommendations to the people of a com-

munity as to how they can obtain, support and keep a doctor in their community.

Attention was called to the fact that the new Social Security Bill contains a paragraph concerning medical care for the indigent along socialized medicine lines and motion was made and carried that a letter be sent to the senators and representatives from Louisiana requesting that they investigate this matter and vote against the bill on this basis.

A question was asked as to whether it is the opinion of the House of Delegates that doctors should continue to lend support to the National Physicians Committee and it was agreed that the work this group is doing is very worthwhile and should be supported in addition to the support given the AMA educational campaign.

It is hoped that every member of the Louisiana State Medical Society is as interested in protecting the American form of medical practice as the members in attendance at this special meeting which is considered one of the outstanding meetings held by this organization.

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NATIONAL CONFERENCE ON MEDICAL SERVICE CHICAGO, FEBRUARY 6, 1949

This conference opened on Sunday morning, February 6, at the Palmer House in Chicago, with considerable sadness due to the untimely death of Mrs. George Lull, wife of Dr. George Lull, Secretary-Manager of the American Medical Association.

Dr. E. F. Sladek of Traverse City, Michigan, President of the National Conference on Medical Service, reviewed the accomplishments of this conference during the past twenty-two years, and paid high compliment to the work that his predecessors had done. This was followed by discussion of "Legalized Medical Research" by two able leaders. Dr. Christ J. D. Zarafonitis of the University of Michigan reviewed in detail the medical problems involved in medical research. He stressed the point that investigators should be properly trained, properly equipped and should not

be handicapped by financial problems or other matters that might hinder this work. He added that certain goals should be attempted in any sort of research work. Many research problems, he said, are carried out very well but are worthless and should probably have not been attempted in the first place. Dr. George Wakerlin of the University of Illinois, discussed certain legal problems in medical research. He stressed that antivivisectionists were obstructing medical research on many fronts. He stated that some states actually have laws prohibiting animal experimentation and gave certain definite qualifications that must be met before research is carried out on human beings.

The next subject, "Can Corporations Such as Hospitals Legally Engage in the Practice of Medicine?", was ably discussed by Dr. Wilbur Bailey, Los Angeles, California. He stated unequivocally that since hospitals or corporations do not have licenses, they are not legally practicing medicine. He described in detail how some of these institutions have tried to circumvent the law. In most cases, he stated, these groups should be prosecuted.

"The Progress of the World Health Organization" and "The Progress of the World Medical Association" were discussed ably by Drs. Frank Calderone, Director, American Office, Washington, D. C., World Health Organization, and Creighton Barker, Executive Secretary, Connecticut State Medical Association, respectively. The fact that world medicine outside the western hemisphere is in such a dilapidated state makes it seem impossible that anyone could possibly want to go into socialized medicine. "The Medical Program of the United Mine Workers of America Welfare and Retirement Fund" was discussed at length by Dr. Warren F. Draper. He planned with the doctors of America to help make this plan work. I think it is necessary for us to realize that Mr. John L. Lewis has come to the doctors for good medical care. Dr. Draper pointed out that they contemplate no other program. Certainly, they do not

want any compulsory health insurance.

At the noon program, Dr. Howard, assistant to Dr. George F. Lull, gave a report concerning the American Medical Association's public educational program. He stated that every woman in America should read "Uncle Sam, M. D.", a recent publication mailed to wives of the doctors.

At the afternoon session, Dr. James R. McVay, Kansas City, Missouri, Chairman, Council on Medical Service of the AMA, told how the Council is trying to streamline its services to meet problems that arise.

Mr. Clem Whitaker, Public Relations Counsel for the AMA Coordinating Committee, spoke on "Implementing the New AMA Program". He stressed the fact that any program that succeeds has to start at the "grass roots". When Mr. Oscar Ewing predicted that the AMA would place a high-powered lobby in Washington, he certainly "missed the boat", according to Mr. Whitaker. He stated that if we can get 140,000 doctors and their wives to work in spreading this message to the people of America, socialized medicine will be whipped. He stressed, again, the fact that socialized medicine is just the opening wedge for *general socialism*.

Dr. Joseph S. Lawrence, Director of the Washington Office of the AMA reported what is going on in Washington at this time and he stressed the fact that if we are going to do anything about socialization of medicine, we must do it within the next ninety days. This came directly from a senate leader, who is against socialized medicine.

A panel discussion on "Postgraduate Education of the Doctor", by Dr. George N. Aagaard, of the University of Minnesota; Dr. C. W. Smith of Harrisburg, Pennsylvania; and Dr. Harold I. Goldman, Denver, Colorado, was conducted. Dr. Smith stated his state society in cooperation with the University of Pennsylvania is carrying postgraduate education to the rural physicians. Their program is similar to the one being carried out by Dr. S. S. Chipman of Louisiana, but is on a more extensive scale. Dr. Goldman's survey on "Specialization in

Colorado" was very enlightening. He lauded the general practitioner and emphasized the fact that we should encourage more men to enter this field and to give them the credit which they are justly due.

Dr. Sensenich, President of the AMA, reported that doctors will not be drafted at the present time. He stated this decision had been made just prior to this meeting by Mr. James F. Forrestal, Secretary of Defense.

The meeting, which was considered very worth while, adjourned after election of officers.

J. P. Sanders, M. D.

AMA ASSESSMENT

We are very glad to report wonderful response by the members of the Louisiana State Medical Society in contributing to the \$25 assessment fund of the AMA. This is an indication of a very fine spirit of our profession by coming to the aid in such an important endeavor. We would urge all of those who have not contributed to do so as promptly as possible because the defeat of federalized medicine is definitely predicated on the amount of education on a national scale which can be produced with your money through the AMA.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

SECOND DISTRICT MEDICAL SOCIETY

The regular meeting of the Second District Medical Society was held at Jill's Restaurant in Kenner, Louisiana, February 21 at 8 P. M., Dr. Joel Gray, President, presiding. Dr. Guy R. Jones of Lockport, president of the Louisiana section of the American Academy of General Practice, spoke on the present threat of socialized medicine. He also discussed the aims and activities of the American Academy of General Practice.

A full report was given by members of the Society who were present at the special meeting of the Louisiana State Medical Society in Alexandria on February 20.

THIRD DISTRICT MEDICAL SOCIETY

A meeting of the Third District Medical Society was held on February 10 in Lafayette. The Society elected its officers for 1949. Professor John F. McCloskey, Dean of Loyola School of Pharmacy, addressed the group on the dangers of our form of Government if it embarks on a program of compulsory health taxation. Eleven members of the clergy of different faiths were guests at the

meeting. They participated in discussion and made recommendations as to how such legislation can be combatted.

The possibility of establishing a Founders' Day scientific meeting in New Iberia was considered. This would commemorate the founding of the Attakapas Medical Society in that city on November 10, 1846.

AMERICAN ACADEMY OF GENERAL PRACTICE

The Orleans chapter of the American Academy of General Practice held its regular monthly meeting January 31, 1949 at the Tulane Hutchinson Building. The members were privileged to hear Dr. E. H. Lawson of Tulane University present an interesting talk on laboratory procedures to be followed in the course of therapy.

Dr. A. Whife's resignation as treasurer was accepted at this meeting and Dr. Eugene Claverie was elected by acclamation as the new treasurer.

A dinner meeting is planned in March in place of the regular February meeting.

DIABETES ASSOCIATION OF LOUISIANA

Dr. A. A. Herold, temporary chairman of the Diabetes Association of Louisiana, has called a meeting of that group for Saturday, May 7, in New Orleans. Further information may be obtained by addressing Dr. A. A. Herold, 1130 Louisiana Avenue, Shreveport, La.

DOCTOR NEEDED

There is need for a doctor in the town of Cameron, Louisiana. The owner of a retail drug store there is desirous of securing a capable physician for this locality and will build an office in which he may practice. There is a population of 1500 in this town. A grammar school is located in the town and a high school is in Creole, Louisiana, which is 13 miles from Cameron and easily accessible by a good highway. Churches in the town are Catholic, Baptist and Methodist. For further information communicate with Mr. Albert Colligan, Cameron Drug Store, Cameron, Louisiana.

POSTGRADUATE COURSE IN PEDIATRICS

A postgraduate course in pediatrics, sponsored by the Louisiana State University School of Medicine, will be held between March 21 and 25 in Room 610 of the school.

PAN-AMERICAN CONGRESS ON MENTAL DEFICIENCY

The seventy-third Annual Meeting and Pan-American Congress on Mental Deficiency will take place on April 26-30, at the Roosevelt Hotel in New Orleans. For further information address Lou Kennedy, Ph. D., Chairman, Louisiana State University, Baton Rouge, La.

UROLOGICAL POST GRADUATE SEMINAR

The American Urological Association through its Southeastern Section announces a Urological Post Graduate Seminar to be held in New Orleans, Louisiana, April 18, 19, 20, and 21, 1949. The Seminar will be under the auspices of the Division of Graduate Medicine, Tulane University School of Medicine. William D. Frye, M. D., Dean of the Graduate School of Medicine will be the Director of these courses in collaboration with the officers and Executive Committee of the Southeastern Section and with the representative of the Central Committee.

The course is designed especially for young urologists, urological residents, surgical interns especially interested in urology, and physicians and surgeons who do diagnostic urology (part time). It will be of especial value to those preparing for the American Board of Urology, but will afford an excellent review for all urologists.

The Seminar includes four full days, Monday, April 18, through Thursday, April 21, and will cover Anatomy, Embryology, Pathology, Physi-

ology, Biochemistry, Endocrinology and Bacteriology. The courses will be given by men who are experienced urological teachers. They will present their subjects in an illustrated and attractive manner. Operative Urological Clinics will be provided on the various services of the hospitals for those who wish to stay over Friday, April 22.

The courses will be limited to 150 registrants. The cost will be \$50.00 except for urologic residents. Because of the great amount of interest already expressed by members in our Section, an early application is recommended.

Address inquiries and applications to:

Wm. W. Frye, M. D., Dean
Graduate School of Medicine
Tulane University
New Orleans, Louisiana

Dr. Hugh T. Beacham of New Orleans, Louisiana is your state's representative on the Executive Committee of the Post Graduate Seminar of the Southeastern Section of the American Urological Association and he will be glad to receive communications concerning the course.

NEWS ITEM

Dr. George M. Haik addressed the ophthalmologists of Birmingham, Alabama, at the University of Alabama Medical School in January. The subject of his address was, "Treatment of Glaucoma."

PROSPECTIVE BUREAUCRATIC OPPRESSION OF DOCTORS

In a sharply-worded statement, commenting on Washington news reports that the Federal Administration plans to launch anti-trust prosecutions against several State Medical Societies, concurrent with the opening of its drive for compulsory health insurance, the American Medical Association today announced that "We will take our case directly to the American people if we find the Government is engaged in political persecution instead of legitimate prosecution."

Dr. Elmer L. Henderson, Chairman of the Board of Trustees of the American Medical Association, declared:

"The American people will not take kindly to Gestapo activities and the doctors of this country, when the health of their patients and the welfare of their profession are at issue, will not be frightened into non-resistance by threats against them.

"We have been making our own inquiry into the activities of Government investigators and if we find that an attempt is being made to use the Justice Department for political purposes, in an effort to stifle opposition to the socialization of medicine, we will air the facts to the people and demand a Congressional investigation into such activities.

"It is both false and absurd to imply that there is a monopoly in health insurance under the hundreds of voluntary systems operating in America today, with more than 52,000,000 insured mem-

bers. But there certainly would be an iron-clad monopoly if Patent Medicine Man Oscar Ewing got through his compulsory health insurance scheme and took over control of medical practice in this country.

"The American Medical Association is vigorously supporting all sound voluntary health insurance systems and is encouraging competition, between the pre-paid medical and hospital plans and the private insurance indemnity companies, because we believe the American people will get better coverage, at a better price, if many competing plans are available. We don't believe the people want a Government monopoly in the health insurance field, any more than they would condone a private monopoly, and we intend to fight the Government monopoly, proposed under compulsory health insurance legislation, even if the Federal Administration resorts to terroristic practices and witch-hunting in an attempt to frighten off opposition."

FELLOWSHIP OF THE AMERICAN COLLEGE OF CHEST PHYSICIANS

The Board of Examiners of the American College of Chest Physicians announces that the next oral and written examination for Fellowship will be held in Atlantic City, June 2, 1949. Candidates for Fellowship in the College, who would like to take the examinations, should contact the Executive Secretary, American College of Chest Physicians, 500 North Dearborn Street, Chicago 10, Illinois.

The Fifteenth Annual Meeting of the American College of Chest Physicians will be held at the Ambassador Hotel, Atlantic City, June 2-5, 1949. An interesting scientific program has been arranged for this meeting and speakers from several other countries are scheduled to appear.

FOUNDATION PRIZE

by

SOUTH ATLANTIC ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS

The South Atlantic Association of Obstetricians and Gynecologists announces the establishment of "The Foundation Prize." Authors of papers on Obstetrical or Gynecological subjects desiring to compete for the prize may obtain information from Dr. E. D. Colvin, Secretary-Treasurer, 1259 Clifton Road, N. E., Atlanta, Ga.

ARMY MEDICAL DEPARTMENT ANNOUNCES DEVELOPMENT OF "DRAMAMINE," SEASICKNESS PREVENTIVE AND CURE

Working in conjunction with civilian investigators, the Army Medical Department has sponsored development of a new drug, "Dramamine," that acts as both a cure and preventive of seasickness or motion sickness, it was announced by Major General Raymond W. Bliss, The Surgeon General.

Credit for the original research is given to Dr. Leslie N. Gay, of the Protein Clinic of Johns Hopkins University Hospital, Baltimore, Maryland, who first began research on the drug in 1947, and Dr. Paul Carliner, also of Johns Hopkins.

In experiments recently completed, almost total cure or prevention of seasickness, in all degrees of severity, was obtained among more than 400 passengers aboard an Army transport in heavy seas.

Both the preventive and curative values of the drug in relation to seasickness were investigated during the voyage. The physicians reported that of the men who received preventive treatment, less than two per cent became seasick. In the therapeutic tests, the drug failed to give complete relief in only three per cent of cases.

During the extremely rough voyage, a total of 418 cases, including relapses of moderate to violent seasickness, were treated with Dramamine. Complete relief was obtained in 407 cases, with partial relief or failure in 11 cases.

Careful observation was made for unpleasant symptoms, but in not one instance, even though thousands of capsules were administered to more than 300 men, was there a complaint or evidence of discomfort which necessitated discontinuance of treatment.

Seasickness has been an important military problem because of the frequent necessity of transporting great numbers of men by air or sea and landing them in excellent physical condition. Especial attention was paid to the problem during World War II, in the course of which many drugs were used in an attempt to control its symptoms.

The drug was used extensively during the summer of 1948 aboard the U. S. S. America. Sufficient data was collected to warrant more extensive and intensive study of the drug. A brief report on the study was submitted to the Chief of Staff and The Surgeon General of the Army.

The Army secured the services of the U. S. Army Transport Ballou, a ship built for service in the relatively calm waters of the South Pacific. In order to try the drug under conditions most likely to produce seasickness, the Ballou was commissioned to carry 1,376 troops from New York to Bremerhaven, Germany, in November of last year. The North Atlantic is extremely rough and stormy at this season, and the vessel, which has more pitch and roll than ships designed for the rough waters of the Atlantic, experienced lists up to 36 degrees, which would tend to cause seasickness among even the hardiest sailors.

Four adjacent sub-level compartments, in which 485 men were quartered, were chosen so that all subjects would be exposed to the same motion of the sea. The men were divided into two groups. One group was used in a study of the drug's preventive qualities, and the other was studied to determine the curative qualities.

The men chosen for the preventive study were divided into two groups. One of these received 100 mg. of Dramamine in capsule form as the transport left New York. A similar dose was given six hours later and then one before each meal and one before retiring. The other group received a capsule containing only sugar on exactly the same schedule. Only Dr. Gay and Dr. Carliner knew who received the drug and who the sugar.

This schedule was continued for 48 hours, and then the administration of capsules was discontinued.

Of the 134 men who received Dramamine, none developed nausea or vomiting while taking the drug; only two men complained of dizziness. The physicians reported that the men maintained excellent morale, even complaining that they were unable to get enough to eat.

Of the 123 men who received the sugar capsules, thirty-five became seasick within 12 hours at sea. When placed on the Dramamine schedule the men in this group, with only one exception, derived complete relief within three hours.

In the compartment where Dramamine had been given from the start but its administration discontinued after 48 hours, 41 men reported that seasickness had developed 10 to 18 hours after the drug was omitted. The drug again was given to these men and 40 regained their normal state of health within 30 minutes to one hour after the first dose.

The group selected for the therapeutic trial did not receive any of the drug at the start of the voyage. Fifteen men became seasick, and 12 of these were immediately relieved after administration of Dramamine.

A sub-group of 33 men received sugar capsules. Nineteen men whose complaints had been nausea and dizziness were relieved within 12 hours by the sugar capsules. They were taken off the sugar capsules and remained well. Fourteen men became progressively worse on the sugar capsules, and complained of excessive nausea, extreme dizziness, and prolonged vomiting. After Dramamine was given, complete relief followed within half an hour after the first dose.

Other men aboard the ship became ill, 195 reporting severe symptoms of seasickness. Of this group, 187 were completely relieved within an hour after administration of the first capsule.

A number of men were so ill they could not retain the capsule in the stomach. The drug was given by rectum and, within an hour they were able to retain both fluids and solid food.

All previous remedies had been combinations of various drugs, such as scopolamine, one of the barbiturate preparations. Dramamine is a single chemical which is believed to have a direct effect on the vomiting center in the brain. It is a member of the chemical family of benadryl and pyribenzamine, which are used in the treatment of

certain allergic conditions. The complete chemical name is beta-diaminoethyl benzohydryl ether 8-chlorotheophyllinate.

Future plans call for broadening of experiments with Dramamine to include such means of travel as landing craft, small boats, and aircraft.

NEW OFFICERS OF COMPONENT SOCIETIES

Assumption Parish Medical Society

President—Dr. Henry A. LeBlanc, Painscourtville
Vice-Pres.—Dr. H. C. Dansereau, Labadieville
Sec.-Treas.—Dr. Julius W. Daigle, Painscourtville

Bossier Parish Medical Society

President—Dr. D. C. McCuller, Bossier City
Vice-Pres.—Dr. E. Scott Coyle, Plain Dealing
Sec.-Treas.—Dr. John B. Hall, Benton

East Baton Rouge Parish Medical Society

President—Dr. Charles McVea, Baton Rouge
Vice-Pres.—Dr. Charles Mosely, Baton Rouge
Sec.-Treas.—Dr. Daniel J. Fourrier, Baton Rouge

E. & W. Feliciana Bi-Parish Medical Society

President—Dr. B. S. Nolan, Jackson
Vice-Pres.—Dr. Paul Jackson, Clinton
Sec.-Treas.—Dr. E. M. Toler, Clinton

Franklin Parish Medical Society

President—Dr. Johnny Bostick, Gilbert
Vice-Pres.—Dr. A. J. Reynolds, Winnsboro
Sec.-Treas.—Dr. H. E. Jones, Wisner

Iberia Parish Medical Society

President—Dr. I. W. Gajan, Jr., New Iberia
Vice-Pres.—Dr. D. E. Bourgeois, New Iberia
Sec.-Treas.—Dr. L. Slipakoff, New Iberia

Lincoln-Jackson-Union Parish Medical Society

President—Dr. T. A. Dekle, Jonesboro
Vice-Pres. (Lincoln)—Dr. H. S. Roan, Ruston
Vice-Pres. (Union)—Dr. C. C. Colvin, Bernice
Sec.-Treas.—Dr. W. H. Kimbell, Ruston

Orleans Parish Medical Society

President—Dr. J. Kelly Stone, New Orleans
Pres. elect—Dr. C. J. Brown, New Orleans
1st Vice-Pres.—Dr. Boni J. DeLaureal, New Orleans
2nd Vice-Pres.—Dr. Sam Hobson, New Orleans
3rd Vice-Pres.—Dr. John J. Irwin, New Orleans
Secretary—Dr. N. J. Tessitore, New Orleans
Treasurer—Dr. J. O. Weilbacher, Jr., New Orleans

Librarian—Dr. Eugene H. Countiss, New Orleans

Ouachita Parish Medical Society

President—Dr. A. S. Hamilton, Monroe
Vice-Pres.—Dr. George A. Varino, Monroe
Sec.-Treas.—Dr. James W. Schonlau, Monroe

St. Martin Parish Medical Society

President—Dr. S. D. Yongue, Breaux Bridge
Vice-Pres.—Dr. Bernard de Mahy, St. Martinville
Sec.-Treas.—Dr. Murphy Martin, St. Martinville

Terrebonne Parish Medical Society

President—Dr. Samuel C. Collins, Houma
 Sec.-Treas.—Dr. Buford J. Autin, Houma

Vernon Parish Medical Society

President—Dr. Edwin H. Byrd, Leesville
 Vice-Pres.—Dr. T. S. Whitecloud, Leesville
 Sec.-Treas.—Dr. W. H. Broyles, Leesville

Third District Medical Society

President—Dr. I. W. Gajan, Jr., New Iberia
 Vice-Pres.—Dr. H. C. Voorhies, Lafayette
 Sec.-Treas.—Dr. Thomas Latiolais, Jr., Kaplan

Fourth District Medical Society

President—Dr. W. C. Gray, Springhill
 Vice-Pres.—Dr. R. H. VanHorn, Mansfield
 Sec.-Treas.—Dr. J. E. Holoubek, Shreveport

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WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

WOMAN'S AUXILIARY

The Executive Board of the Woman's Auxiliary to the Louisiana State Medical Society met in Alexandria, February 19, 1949, at the Bentley Hotel. The meeting was conducted by Mrs. O. B. Owens, President. (Mrs. Arthur A. Herold, Shreveport, Treasurer of the Woman's Auxiliary to the AMA was an honored guest). Reports were given by the twenty-five members present and several recommendations were made by the Executive Committee and passed by the Board to be presented to the delegates at the Convention. The following members were elected to serve on the Nominating Committee to meet before the Convention: Mrs. Rhodes Spedale, Chairman, Plaquemine, Mrs. A. Dent Tisdale, Monroe, Mrs. Wiley A. Dial, Baton Rouge, Mrs. Clarence Erickson, Shreveport, Mrs. George Taquino, New Orleans; Alternates, Mrs. M. C. Wiginton, Hammond, Mrs. A. Scott Hamilton, Monroe, Mrs. Dorman B. Barber, Alexandria, Mrs. Felix Boizelle, Baton Rouge, and Mrs. Cassius Peacock, New Orleans.

Members of the Board attended a luncheon at the Bentley Hotel arranged by the Chairman, Mrs. L. D. Gremillion.

The Convention Chairman, Mrs. C. Grenes Cole, announced the following program of the Woman's Auxiliary to be held in conjunction with the Louisiana State Medical Society, May 5, 6, 7, 1949.

Thursday May 5, 1949

Registration

Pre-convention Board Meeting.

Friday May 6, 1949

General Session—Mrs. O. B. Owens presiding

Tea and Style Show at Orleans Club in honor of Mrs. John Dunn, incoming President.

Saturday May 7, 1949

Postconvention Board Meeting

Luncheon—New Orleans Country Club.

The Woman's Auxiliary and its members who attended the Special Meeting and luncheon February 20 are deeply grateful for the invitation from the Medical Society to hear the addresses given by Dr. R. B. Robins, member of the AMA Council, Hon. Forest A. Harness, member of the 80th Congress, and John F. McCloskey, Dean, Loyola University School of Pharmacy.

Haddon Hall will be the headquarters for the Annual Meeting of the Woman's Auxiliary to the American Medical Association, which will be held in Atlantic City, New Jersey, June 6 to 10, 1949.

Requests for reservations should be sent at once to Dr. Robert A. Bradley, Chairman, Subcommittee on Hotels, 16 Central Pier, Atlantic City, New Jersey.

Members of the Woman's Auxiliary to the Orleans Parish Medical Society were entertained at their February meeting by Mrs. Frances Griffin Bres with violin selections. Among those attending the program and reception were members of the Executive Board of the Dental Auxiliary to the Louisiana Dental Association. The president, Mrs. E. A. Socola, has announced that the March meeting will be a Fashion Show and Reception with the wives of doctors who attend the Graduate Assembly as guests.

A Forum on Cancer was the February program for the Woman's Auxiliary to the Shreveport Medical Society. The President, Mrs. Jos. E. Heard has announced a new Speakers Bureau Committee of the Auxiliary set up as the Speakers Bureau of the Society. All women's clubs are being contacted and asked to give some time on their programs to our present problems.

Mrs. F. H. Davis was elected president of the Woman's Auxiliary to the Lafayette Parish Medical Society when it was reorganized in 1948. Its major project in 1948 was a five hundred dollar contribution to the Cancer Society with funds raised by a style show sponsored by the Auxiliary. At a recent meeting Mrs. George M. Armstrong, Jr., parish visiting teacher, presented an informative talk on health needs of school age children. In May of each year the Auxiliary has a tea to which all of the senior girls of the parish are invited. Nurses and medical technicians address this group on the value of becoming nurses or technicians.

Auxiliary members interested in reading the testimony of Dr. Marjorie Shearon should write for Vol. V of the Hearings on S. 545 and S. 1320 of the 80th Congress to Mr. Ray Rodgers, Clerk, Senate Committee of Labor and Public Welfare, Washington, D. C. It is free.

BOOK REVIEWS

Manual of Leprosy: By Ernest Muir, C. M. G., C. I. E., M. D., F. R. C. S., Edin., Medical Adviser, British Empire Leprosy Relief Association; Secretary, International Leprosy Association; Late Research Worker in Leprosy, School of Tropical Medicine, Calcutta. Baltimore, The Williams & Wilkins Company, 1948. Pp. 208. Price, \$5.00.

The appearance of two works on leprosy, (the other by Dr. R. S. Cochrane), in about a year by English writers is probably due to reports of more promising drugs for treatment.

Dr. Muir has had broad experience with leprosy in many parts of the world and writes authoritatively on the subject. The present volume puts into a very small space the essentials of handling the disease, and is made up of twenty-seven chapters under three broad headings.

The first section, consisting of eleven chapters, is devoted to discussion of general features, including history and classification. The physician who has not kept in touch with developments in this field will find especially helpful the discussion of the tuberculoid type, which is illustrated by a number of useful colored pictures. The relation of the "uncharacteristic" form to the two main types (lepomatous and tuberculoid) is shown by a readily understood diagram.

The second section, consisting of nine chapters, deals with diagnosis and treatment. Dr. Muir has more confidence in the results of histologic examination than seems warranted by the frequently encountered unsatisfactory or contradictory reports on this phase of diagnosis. One can heartily agree with the author's low opinion of skin tests with lepromin, as an aid in diagnosis but he finds them of value in prognosis and type diagnosis. Chaulmoogra oil is preferred by Dr. Muir in the treatment of tuberculoid lesions, which of course are very likely to do well without any, or with no special treatment. He favors intradermal administration of the oil. Dr. Muir is impressed by the value of the sulfones in lepomatous leprosy and has used diasone chiefly. This drug, if further experience confirms its usefulness, has the advantage of being given by mouth, a factor that makes it convenient for use by physicians in private practice, and should go far to simplify treatment.

The chapter on surgery deals with several common surgical complications but makes no mention of tracheotomy for laryngeal obstruction. In the chapter on prognosis, Dr. Muir recognizes the great tendency of leprosy to spontaneous improvement, even in severe cases.

The third section, consisting of seven chapters, entitled "The Anti-Leprosy Campaign", will be of most interest and importance to health officers. Dr. Muir views the subject in a broad way. Clearly,

in his opinion, it is not simply a matter of making a diagnosis of leprosy and consigning the patient to an isolation center. The Norwegian plan, based largely on home isolation, is spoken of with approval. Compulsory isolation is regarded as necessary only in endemic areas if suitable accommodations can be provided for all cases. Dr. Muir regards the distribution of immune and endemic regions in the United States as due largely to differences in standards of living and sanitation in various areas. "Leprosy consciousness," by which the author means fear of the disease by the general public, is recognized as of great importance in aiding in the control. Two chapters are devoted to leprosy surveys. One type of these is designated P. T. S. (Propaganda—Treatment—Survey), in which therapy and education are combined with case finding—as in tuberculosis campaigns—a very logical approach. Out-patient clinics are regarded as most helpful in such a program.

A chapter is devoted to "Health Children of Leprous Patients," and the Brazilian "preventoria" are favorably regarded. The final chapter in the book is a consideration of Social and Welfare Service, with reference especially to education, occupation, recreation, and spiritual elements. Nor are the dependants of patients forgotten; the family must be provided for when the bread winner is no longer in a position to provide support. An appendix deals with the preparation of the esters of chaulmoogra oil,—which seems superfluous—and another with "Intensive Surveys," which might be helpful.

One is pleased to note that Dr. Muir has avoided the use of the word leper, an omission that will be appreciated by patients suffering with leprosy.

Finally there is a bibliography arranged under the headings of the chapters of the text.

G. W. McCoy, M. D.

You and Your Doctor: By Benjamin F. Miller, M. D., New York, Whittlesey House, 1948. Pp. 183. Price, \$2.75.

This book attempts to bring to the lay citizen a frank discussion of group medical practice and other modern trends in American medicine.

For the "pilot physician," a well compounded mixture of the family doctor and the specialists, a three year postgraduate period is not excessive, particularly if through government participation, adequate salaries were provided for interns and residents.

Doctor Miller believes that group clinics for all areas would provide better diagnosis and treatment. These may be provided by guaranteeing the income of a local medical group on an actuarial basis, by an insured prepayment plan, or by a tax-supported plan, or any other workable variant.

Giving further responsibility to the government, he states that nursery schools should be provided for all families, regardless of financial status.

Federal support of medical science and practice, eventually extending to medical education, rounds out the author's all-inclusive program.

Though we may not be in accord with Doctor Miller's hopes and dreams, it is important that we know both sides of the issue.

EUGENE H. COUNTESS, M. D.

Psychobiology and Psychiatry: A Textbook of Normal and Abnormal Human Behavior; by Wendell Muncie, M. D. 2nd Ed., St. Louis, C. V. Mosby Co., 1948. Pp. 620. Price, \$9.00.

This is the second edition of a book which was first published in 1939. Because of the many subsequent changes, sometimes of a revolutionary nature, in our thinking about psychiatry, extensive editing and revision have been necessary. There were formerly four major divisions of the text; the fourth, which contained historical appendices, has been omitted, because this material is now generally available in most medical libraries.

Primarily written for the student, this is a textbook which "attempts to give a fair account of the conceptions, teaching, and working methods" of the Henry Phipps Psychiatric Clinic at the Johns Hopkins Hospital. Accordingly, the nomenclature of Adolf Meyer is used, but not insisted upon.

Perhaps the most valuable—and unique—single section is the first, entitled, "Psychobiography—The Study of Normal Behavior." This is devoted largely to the student's personality study, which is an excellent preparation in the technics of observation and understanding of a human being, in this case the student himself. The second section, "Abnormal Behavior—Pathology and Psychiatry," is liberally studded with case histories illustrative of the various pathologic processes described. The final section on "Treatment" furnishes a full introduction to the general bases of therapy and to the important therapeutic aids—including pre-frontal lobotomy—available to the psychiatrist. The remainder of this section is then devoted to the more specific treatment of the various reaction states. The theories of psychoanalysis are perhaps unduly slighted, but with this possible exception, the book offers both student and general practitioner a reasonably well balanced survey of the enormous field of psychiatry and its related problems.

THEODORE F. TREUTING, M. D.

Essentials of Pathology: By Lawrence W. Smith, M. D., F. C. A. P., and Edwin S. Gault, M. D., F. C. A. P., 3d ed., Philadelphia, The Blakiston Co., 1948. Pp. 764. Price, \$12.00.

The authors are experienced pathologists and teachers. They have compiled a splendid collection

of cases, which serve as illustrations for the pathologic processes discussed in their text. In most instances there are good photographs, or diagrams of the lesions. The material is presented in orderly fashion and the style is clear, concise and to the point. The microscopic descriptions of the lesions should be particularly helpful for medical students. Although "Essentials of Pathology" is not intended to be a reference volume in pathologic anatomy, it has a select bibliography at the end. The book is recommended for teaching of sophomore medical pathology when instruction is primarily of the single textbook type. If the teaching program is such that the students do not have to follow a particular textbook, but must acquire their information from various sources, we feel that some of the other books on this subject would be more advantageous.

G. M. CARRERA, M. D.

Diagnosis in Gynecology: By James V. Ricci, A. B., M. D., Philadelphia, The Blakiston Company, 1948, pp. 259. Price, \$4.50.

The aim of this text is to teach the art of gynecological history taking and conducting a careful examination in order to arrive at a correct diagnosis. The author has attempted to stress analyzing, evaluating, and synthesizing signs, symptoms, findings and laboratory data so that the student may learn to think in terms of sound differential clinical logic.

Since this book is only intended to supplement the standard texts on gynecology, the chapters on anatomy, histology, and embryology might have been deleted as unessential.

The genital structures, and the various diseases which affect them, form the basis of presentation and chapter division. The medical student will find this practical approach most helpful.

EUGENE H. COUNTESS, M. D.

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The C. V. Mosby Company, St. Louis: *Clinical Case-Taking (Fourth Edition)*, by George R. Herrmann, M. D., Ph. D. *Campbell's Operative Orthopedics (Vol. 1 and II) (Second Edition)*, J. S. Speed, M. D., Editor, Hugh Smith, M. D., Assoc. Editor.

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AN INTRODUCTION TO THE AMERICAN ACADEMY OF GENERAL PRACTICE

STANLEY R. TRUMAN, M. D.†

OAKLAND, CALIFORNIA

The American Academy of General Practice was founded June 10, 1947, by a group of men firmly convinced that general practice is the backbone of the finest medical system the world has ever known, and that general practice is economically and medically the soundest means of distributing care to the American people. They believe that the fine things in general practice cannot be preserved and that medical science and art cannot be advanced without the organized effort of the general practitioners. Numerous small groups of general practitioners throughout the country had organized, but general practice on a national scale had no voice. Therefore, the members and officers of the Section of General Practice of the American Medical Association meeting, out of official session, at San Francisco Convention in 1946, set in motion the machinery that culminated in the founding of the American Academy of General Practice, at the 1947 convention at Atlantic City.

The Academy has no official connection with the American Medical Association, except that Fellows must be members of the American Medical Association. The Acad-

emy plans to support the A.M.A. in its high ideals and will support every other group whose aims are unselfish and for the best interests of individual and public health.

The following quotation from the Constitution will clearly show the purposes for which the Academy was founded:

1. "To promote and maintain high standards of the general practice of medicine and surgery.
2. To encourage and assist young men and women in preparing, qualifying, and establishing themselves in general practice.
3. To protect the right of the general practitioner to engage in medical and surgical procedures for which he is qualified by training and experience.
4. To assist in providing postgraduate study courses for general practitioners, and to encourage and assist practicing physicians and surgeons in participating in such training.
5. To advance medical science and private and public health."

The requirements for membership are high but simple. For those older men who may not be able to fulfill the letter of the requirements, but have more than fulfilled them by years of experience and study, the Board of Directors by vote may waive any specific requirement. To be eligible for membership the physician must be engaged in general practice. He must be duly licensed in the state in which he practices, and must be of high moral and professional character. He must have had at least one year of rotating internship at an approved hospital, or the equivalent in postgraduate training. He must have been in general practice for at least three years. (Special consideration is being given by the Membership Committee to military service). He

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†Secretary, American Academy of General Practice.

must have shown interest in continuing his medical advancement by engaging in postgraduate educational activities.

A feature of great interest to prospective members is the requirement that in each three year period a Fellow must complete one hundred and fifty hours of postgraduate work. The Membership Committee has not yet published the accepted list of work fulfilling this requirement, but it is expected that the plan will follow somewhat those of similar groups who have allowed about one-third of the hours at staff meetings one-third at conventions, and one-third at postgraduate courses.

The organization of the Academy is patterned upon a combination of the most desirable features of the leading medical organizations and the American Bar Association. The constitution will show that it is both efficient and democratic. Provision is also made in the by-laws for the establishment of State and County Branches of the American Academy of General Practice.

Since its inception the progress in organization has been remarkable. After only three months the membership is larger than all but the two or three largest specialty groups, and the Academy is represented in forty-one of the States, and Hawaii.

Every general practitioner owes it to himself and to the profession to which he has been called, to qualify for membership in the American Academy of General Practice; and when he has become a Fellow, to do everything in his power to further its aims.

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TRENDS OF MEDICAL PRACTICE

P. A. DAVIS, M. D.†

AKRON, OHIO

The trends or changes in medical practice have run on a parallel with those of science, influenced by demands and economic changes. The world population as

a whole is striving for better living standards, and the key to all of this is good health. Periods of depression, war, and inflationary changes affect the trends in medicine and science, and therefore, the health of our people.

Three hundred years ago much empirical medicine was practiced, and the measure of medical progress and advancement cannot be standardized by the number of survivors from such empirical methods. Advancement in medicine, as in all other fields, is accomplished by research and investigation into the reason for the mistakes that have been made. The results of such investigations preclude the repetition of those mistakes. The practice of medicine has passed through this empirical stage, out of which many brilliant minds were developed, and many lasting discoveries were made. It is true in medicine, as it has been in chemistry, biology, and physics, that many of our great discoveries were accidental, and we term these "fortunate accidents". For example, penicillin was accidentally discovered by Sir Alexander Fleming, of England, while he was working with some culture plates of staphylococcus which had been accidentally exposed to contaminated air.

The trends in medicine have been on the positive side ever since the discoveries of such important things as the stethoscope, microscope, roentgen rays, radium, vaccination, and immunology.

Let us review some of the accomplishments which have been recorded as furthering the progress of medicine and benefiting the human being.

1. EDUCATIONAL IMPROVEMENTS AND REQUIREMENTS

We no longer find the doctor who became such through an office apprenticeship, and if I am correctly informed, calomel, castor oil, turpentine, kerosene, and various other kitchen remedies have suffered in popularity. Such an era, was inevitable with the lack of transportation, educational, and research facilities. The doctor of today, when he enters practice, has an education second to none, not only in the scientific subjects, but in literary subjects as well,

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and as progress is made, these other various topics will be added to his curriculum. Postgraduate instruction has been instituted by many medical colleges over the country in response to the demand of the general practitioner, who desires refresher courses. Local and district medical societies have also demanded postgraduate days for their members, so that they may keep abreast of the modern developments in treatment and technic. The national trend is for more knowledge which the practicing physician can take back home and thereby improve his value to his community.

2. HOSPITAL DEVELOPMENT

The development of the hospital to its present standard has been one of the influential factors in providing education and experience for the physician of today. We do not have sufficient hospitals, especially in rural areas. When this has been accomplished, rural medicine will progress and the individual will benefit thereby.

3. RESEARCH FACILITIES

One hundred years ago very little research was being done, and what was being done suffered from lack of material, finances, and technically trained men. Research has made great strides during the past fifty years because it has obtained financial support from various sources. Large pharmaceutical firms have expended vast sums; medical schools have obtained grants for definite research; closer cooperation and the coalition, in many cases, of hospitals and medical colleges supply facilities which are necessary for research; and, finally various Governmental agencies have set up research and teaching facilities which can accomplish much which the private group cannot afford to finance.

The development of industry, which needed medical service, has led to the establishment of factory hospitals and research laboratories with well trained personnel. From these have come information as to the toxicity of various materials to which the workman is exposed and the development of methods treating these conditions if they arise.

4. DEVELOPMENT OF NEW PROCEDURES OF TREATMENT

Knowing what we do today, if we were to be transplanted back fifty years, we should be at a loss as how to treat a patient. The development of deep x-ray therapy, elemental radiation, and atomic fission is a remarkable advance over the old hand power static x-ray machine. What is in the future for atomic power as a medicinal factor is only predictable at this time and, until further experiments are made available by scientists, it must remain as such. New developments in medicine, surgery, obstetrics, orthopedics, allergies, and ophthalmology have markedly lowered morbidity rates.

5. DEVELOPMENT OF NEW MEDICINES

a) Chemotherapeutic agents — sulfonamides of various types, with which you are familiar. Radiated iodine and phosphorus and atomic energy will play future roles in the treatment of malignancy, anemias, and stimulation of growth factors.

b) Antibiotics, notably penicillin, streptomycin, tyrothricin, and gramicidin, will be improved.

c) Vitamins—closely related to amino acids have a field all their own.

d) Anti-allergic and antihistaminic drugs.

e) Split protein or hydrolyzed amino acids.

f) New drugs for malaria and tropical diseases.

g) Many other scientific drugs and serums.

The next fifty years will be the age of scientific research if future developments are as productive as in the last twenty-five years. These new developments have aided the physician in the treatment of diseases and they have reduced the mortality rates markedly. For example, in the last thirty-four years the death incidence from pneumonia and tuberculosis has been reduced by four-fifths and for cardiorenal vascular diseases by one-third.

6. DEVELOPMENT OF PUBLIC HEALTH CONTROL AND PREVENTION CLINICS

The education of the public is a prime factor in preventive medicine. If more

people spent as much time and money in keeping their human machines in as good and efficient working condition as they do their automobiles and other mechanical machines, we would have fewer chronic ailments and we would prevent many acute ailments.

7. DIAGNOSTIC METHODS

These have been so improved that every physician can have them available if he so desires. This should increase his diagnostic acumen by 80 per cent. What have all these developments done for the individual and the public at large?

a) Life expectancy has been increased from 37 years in 1850 to 65 years in 1947, with a predicted 70 years by 1970. "In ancient Gaul in Caesar's time, expectation of life for an infant was 18 years. . . . In Gaul in 1750, it was 28 years. . . . In America in 1850, 37 years. In 1900, 46 years. In 1944, 64 years. In 1947, 65 years. In 1970, it may reach 70 years. Expectation of life is the aggregate years that a group of persons will live, divided by the number in the group." (Dingman.)

b) Mortality rates have been greatly reduced. Infant mortality rates have been markedly reduced in the past twenty-five years.

c) Morbidity rates have been greatly reduced.

d) Human physique has been improved.

e) Periods of confining and hospital stays have been reduced.

f) Better medical service. In fact, the best medical service in the world is available to the American public through its highly trained graduates of medicine.

g) Development of state and community health programs, which are and should be primarily preventive, not curative, in principle.

h) Development of free medical clinics, welfare and health services which provide care for the indigent, aged, blind, and many others who are financially unable to meet the expenses of the present period.

FUTURE PROGRESS OF AMERICAN SYSTEM OF MEDICINE

Reliable statistics show that we are the best fed and healthiest nation in the world.

They also show that we are the world center for medical education and research. These facts we can be proud of and we may congratulate ourselves on our accomplishments which have been possible because we have, up to now, been smiled upon by free enterprise. Shall the American system of medicine continue to progress as it has in the past fifty years, or shall we become subject to many restricting factors?

In my opinion, there are many things, which, if they become effective, will revolutionize the practice of medicine to such a degree that we shall no longer maintain the world leadership which we hold today. What are some of these factors which are developing currently and gaining momentum and which will alter the course of medicine in the future?

a) Centralization of medicine, leaving rural districts without medical services. This has happened owing to the fact that medicine has become a very scientific subject, and graduates of today are trained to use all available clinical and scientific diagnostic procedures to arrive at a correct diagnosis. These facilities are not available in rural communities; therefore, the practice of medicine has become centralized near available facilities. These conditions can be corrected when rural communities make such facilities available to the physician. Recent legislation for aid in construction and development of rural hospitals should be an impetus to all communities to commence such programs.

b) Over-specialization. If specialization continues to the point where every doctor is a specialist, the public will suffer. For example, John Doe supposedly has a conjunctivitis, nephritis, myocarditis, hemorrhoids, and a boil. To get cured he must see an ophthalmologist, a urologist, a cardiologist, a proctologist, and a surgeon, or, as a descriptive article from *American Science* for 1947 states:

"A pain in the head may call for x-rays of the *Gluteus maximus*, and an upset stomach may require the attendance of a brain expert who insists upon having an encephalogram made. And when the specialist who is trained to look for but one source of trouble does not find it, he sends the sick

man on to another doctor who starts on a hunt for something else. At last when no one is able to discover a material reason for the illness the poor bewildered victim is advised to try mental treatment and there he may discover that the pain in his arm is the result of not having necked forty years before with an almost forgotten young woman."

The specialist himself will suffer, because these patients will consult osteopaths, chiropractors, naturopaths, and many other faddists. The public loses that sacred doctor-patient relationship which we have been advocating for ages. Specialization should have as one its requirements at least five, and preferably, ten years, in general practice. Dr. Ernest Irons has made the statement that we should have four or five general practitioners for every specialist. Statistics show that we have almost 40,000 full specialists and about 50,000 half or part time specialists. This is over specialization and should not continue. In 1947, 23,900 students were enrolled in 77 medical colleges, 6,389 graduated, and approximately 4,000 physicians died. A net gain of about 2,300. This gain is in proportion to the population gain, but because of the over-specialization few of these graduates are entering the general practice of medicine. This is an unhealthy situation, especially for the rural districts. It fosters socialized medicine. Be a better doctor, attend post-graduate meetings, and take up advanced training in procedures in which you are interested. You, as general practitioners, should equip yourselves to do 80 to 85 per cent of all the practice of medicine and be capable of referring your patients to the most capable specialist when it is necessary. In some communities which are over-specialized, the public enters complaints because it cannot find a doctor to make a house call.

c) Political encroachment. For many years, since 1912, there has been a movement to subject medicine to some kind of political control, either state or Federal. We have been rather complacent in the past, feeling that such a situation could not develop in a free country such as ours. We felt that our legislators would protect us,

and they did in most cases, but with the social changes that have been introduced already and those that are planned for the future, this is not the time to permit ourselves to think we are "untouchables". If we will scan the record of the past years, we shall see that many states have passed legislation granting licenses to limited practitioners of various cults and faddists, both religious and non-religious. Many hospitals not recognized by the Council on Medical Education and Hospitals are in operation. These changes have come to pass through political forces. If federalization of medicine becomes a reality, then both parties concerned—the public and the physician—will be denied the fruits of progress.

d) Discouragements placed before the young man who desires to go into general practice. The present trend in education for the medical student is one preparatory course for Board certificates. The hospital internship is a step toward a Board residency and does not give the student who is going into general practice the desired training. More universities should follow the plan of Colorado University and establish a residency in general practice. The University of Kansas has just recently established a residency in general practice also, and I understand that Louisiana State University is going to establish two general practice residencies, and probably a chair in general practice. The University of Louisville has a chair in general practice, headed by an Academy member, Dr. D. G. Miller. All hospitals should have Sections on General Practice and the residency should provide graduate instruction in the various specialties. Many hospital staffs are so over-specialized that the staff appointments are discriminatory, and the man who has started in general practice is denied staff appointments, although his training, diagnostic, and therapeutic ability is often above that of the appointee. This is not in accord with the American Medical Association's Council on Medical Education and Hospitals. Finances often mold the educational course of an individual and over-education does not always make the

most successful physician. The young student today who plans to go into general medicine needs encouragement from medical colleges, hospitals, medical organizations, communities, associates, and the public, if we are to fulfill our duty to the country as a whole.

e) Public relations. Good public relations will do more for the practice of medicine than any other single factor. Public relations must start with the individual physician and his patients, then the local medical society and the community, then the state, and finally, the national associations. As Charles M. Swart has remarked, "Public relations are the sum total of private relations". The sensational, dramatic, and exaggerated stories of some editorial writers about scientific medical facts is often misleading to the public, and the physician is called upon to give his patient the true facts. Give the public the medical truths, and they are comprehending and cooperative. The American public desires to be self-supporting and not subject to governmental dictates. Public relations should encourage self-reliance and individual thinking.

CONCLUSION

Scientific medicine will continue to gain greater scientific recognition. In the years to come, many new discoveries will be brought forth to benefit the human race. Life expectancy will be increased, and we can hope for a future of centenarians. World collaboration on health, welfare, and scientific discoveries will add to the future benefit of mankind, if they are used specifically for this purpose.

The practice of medicine will continue and should become more efficient, gain more public cooperation, and increase in preventive potentialities, if we continue under free enterprise. Should this one factor, which is predominantly an American heritage, be destroyed, future actions and decisions of the medical profession itself

will shape the destiny of the practice of medicine in America.

In closing, I would like to quote from an address by Mr. Bernard M. Baruch:

"What is this adventure in health I see dawning, and towards which you all have been keeping the doctor's vigil through the night? This adventure, which you will have to lead—or it will fail—has many elements:

1. More and better doctors—in more places.
 2. An immediate, complete survey to modernize medical education, with greater emphasis on chronic and degenerative diseases, mental hygiene, and preventive medicine.
 3. More hospitals more evenly spread through the country.
 4. Less specialists, more general practitioners.
 5. Reorganize medical practice, stressing group medicine where needed and voluntary health insurance.
 6. For those who cannot afford voluntary insurance, some form of insurance, partly financed by the Government, covering people by law. I would call this "compulsory health insurance," if that term's proper meaning had not been lost.
 7. Increased medical research.
 8. Greatly expanded physical and mental rehabilitation.
 9. Education to make health a national habit.
 10. A vigorous, preventive medical program, reaching everyone, children above all.
 11. A new cabinet post for health, education, social security.
 12. Creation of a nonpolitical, watchdog committee to safeguard progress in medical care for veterans.
 13. Increased numbers of well trained nurses and technicians.
 14. Adequate dental care.
 15. A stabilizing economy—inflation will make worthless any health program or anything else."
- And now, for your serious thought and consideration, I would ask these three questions:
1. Are the doctors going to do the practicing of medicine in the future?
 2. Are the hospitals going to do the practicing of medicine in the future?
 3. Is the Government going to do the practicing of medicine in the future? You now have the leadership. Keep it—get in and pitch!

HOME OBSTETRICS*

D. G. MILLER, M D†

MORGANTOWN, KENTUCKY

I can speak with authority on my subject as I practice in a very rural county. I began when all of the deliveries by other physicians and midwives in the county were under the cover. It is fitting that we examine ourselves and if criticism is due that we, the general practitioners, who do nearly all of the home obstetrics, and more than 50 per cent of all deliveries, decide if our procedures are in error, and if so, that we correct them.

Frank R. Lock of Winston-Salem, N. C., described the program for examining all maternal deaths in North Carolina at the last meeting of the Southern Medical Association. In this analysis, which is applicable to all of the South, he disclosed that only about 10 per cent of the deaths of mothers could be attributed to the mother's own negligence. Further, he showed that of the 90 per cent of maternal deaths which have been due to physicians' errors, that only 10 per cent had had consultation.

I must stress these facts because I believe that obstetrics, not just home obstetrics, is the most poorly done branch of modern medicine. I propose to try to prove this thesis and to show that home obstetrics can be as good as the hospital variety.

PROBLEMS IN RURAL OBSTETRICS

The criticism of obstetrics as it is done in the rural areas can be divided into three parts: Neglect on the part of the patient, neglect or errors of judgment of the physician, and lack of time of the physician. Perhaps the second and third are a part of each other; I do not think so.

Neglect on the part of the patient is due to lack of money, lack of education as to the

value of proper prenatal and puerperal care, and to lack of knowledge of the dangers of neglected obstetrical care and finally to another phase of education, the deeply rooted customs of some areas. These may apply to the use of midwives, regardless of the availability of physicians, or to the custom of waiting until the patient is in hard labor before consulting a physician for any sort of care.

I am certain that proper cooperation among the general practitioners, and proper regard for the welfare of the patients could advance the prenatal and delivery care rendered to a much higher plane. When the patient cannot understand the value of more and better care, and feels that it is a useless expense, it takes full cooperation among all concerned to get reluctant patients into our offices. I know of an area where medicine was set back twenty-five years by a group of physicians who practiced just as the patients wanted them to. This meant that the young men as they came into the county, dropped back into the methods of the poorest and oldest physicians, for fear that the modern medicine that they had been taught would offend someone.

Patients must be gradually educated, but it does little good for one group to try to advance medicine when another physician can tell them that the new (to the patient) methods are useless and that the old ways are best. Individual deaths and morbidity among mothers may be attributed to the patient, but as a group even these deaths and illnesses must be laid to us. We must educate our patients.

When the second group of patients is discussed, we must take the blame for any who die, suffer unduly, or develop ills secondary to delivery when we have not insisted upon the best possible care. I find that whenever I allow a patient to talk me into doing what they want, rather than what I know is best, that we usually have trouble and regret it. Errors of judgment or lack of knowledge upon the part of the physician are pitiful. These cases are few and far between. The error of failing to ask for con-

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sultation is a far graver one, in my opinion, than lack of knowledge. Any of us can recognize that all is not going well with our patients and can then ask for consultation. If this is not forthcoming, it is usually possible to demand hospitalization, and there obtain consultation and assistance.

The most serious and most easily prevented error in obstetrics is impatience and consequent meddlesome procedures. I do not mean that we should allow the patient to lie in bed without attention until the head is born, but I do feel that the desire to get through and get back home leads to too much pitocin, too high forceps, and exhausted patients, who are told to bear down from the time of the physician's arrival, until he leaves; or worse still, some physicians make their patients walk until delivery is imminent. Too many times the physician tires of the screams of the mother-to-be, and the constant worrying of the family and either resorts to too large and unjustified doses of pituitrin, or attempts a complicated procedure, when a little watchful waiting would allow a relatively easy delivery. I particularly refer to forceps manipulation of the posterior occiput when a little time and manual rotation would do far better. I feel that this is the most frequent and the most abused complication of labor. I know that our records show that we have spent more time waiting for the head to rotate, or for dilatation and descent to progress far enough for manual rotation and delivery, than for any other obstetrical problem.

This criticism of the medical profession for meddlesome obstetrics can be leveled at the specialist as well as at the general practitioner and rural physician. I know of several men who attempt to deliver so many women that they resort to all sorts of procedures to hurry the individual case up so they can either get to the next patient, or to the office, or home to bed. I know one man who required discipline by the hospital staff for routinely ordering 1 cc. doses of pituitrin. This type of obstetrics with its subsequent complications does much to increase death and morbidity.

The lack of time to devote to the patient is our most serious problem. We have so many patients to see and so much to do, that we no longer can go to the home and wait hours, eating with the family, often sleeping in the same room with the patient, in order that we might be with her from the onset of labor until its safe conclusion. This lack of time forces us either to adopt the meddlesome tactics that I have discussed, to leave the patient alone during much of her labor, or to hospitalize her so that a nurse may watch her and report progress and notify us when she is ready for our care. However, we have had many intelligent families who were just as capable of giving barbiturates and allowing the patient to precipitate at home, as busy nurses who gave sedation as ordered, and allowed the patients to precipitate in their hospital beds. We find that patients are allowed to precipitate most often just as nurses change shifts.

The procedures that I have used in my home practice I use in my hospital practice *with better results in the home*. The figures that I will show you at the conclusion of the paper will bear me out in this. Our patients delivered at home have less fever and none of the episiotomies have broken down. It may interest you to know that for sometime it was necessary for us to take the obstetrical bag into our hospital delivery rooms in order to have adequate equipment. One hospital still has but one DeLee tracheal catheter. We will give any interested physician a list of the equipment carried in our bags. Hospital facilities give us plasma, incubators, and oxygen-carbon dioxide for resuscitation; more immediate consultation and gas-oxygen anesthesia, with a trained anesthetist. However, we have sent in from the house for plasma, obtained and started it in less time than has been possible to do the same procedure in some hospitals. Plasma cannot be carried in a hot car; therefore, we do have to send back to our office when its use becomes necessary.

PRENATAL CARE

The proper care of the obstetrical patient begins with the prenatal care. In rural

areas, where most home deliveries are done, it is a very grave problem, not yet solved in its entirety, to get the prenatal patient into the office. I feel that our greatest assistance has been the law requiring a prenatal Kahn, and our personal rule that all obstetrical patients who do not come into the office before the sixth month, will have to be delivered in the hospital. There is not enough time to detail prenatal care, but we do the following as a minimum: On the first visit, a full history is taken. Positive findings are entered on a history card. A complete physical examination, including eye-grounds, the usual head, chest, abdomen, and pelvic, including measurements. The minimum laboratory work includes a Kahn, hemoglobin, and urine. In the South, there are very few women who do not need iron, and I have yet to find a pregnant woman with as much hemoglobin as I feel she needs, namely more than 14.5 gm. On each of the follow-up visits, she is weighed, her blood pressure taken, and urine examined for albumin. She is questioned for any signs of toxemia. The check-up visits are usually handled by one of our nurses. If there is unusual weight gain, elevation of blood pressure, more than a trace of albumin in the urine, or if we can get a history of visual signs, or headache, or observe any edema, a more careful examination is made and she is asked to return in three to seven days, rather than fourteen to twenty-eight, depending upon the stage of the pregnancy and results of the tests.

We cannot marshal many facts to prove our conclusions, but at the present time we definitely think that patients with adequate diets have much less toxemia than those with inadequate food intakes, especially proteins. This observation followed work done at Duke University. Most of our toxic patients came from a group that have had poor E.N.T. care from birth and many untreated streptococcal infections; especially unrecognized scarlet fever and nephritis. This particular section of the country also has the poorest diet, and the most depleted soil. We urge adequate protein intake, force fluids, and use bedrest, sedation and usual-

ly veratrite (a proprietary containing Veratrum-Viride, 3 Craw units; sodium nitrite, 1 grain, and phenobarbital 1/4 grain). If we fail to control toxemia with this regime, we hospitalize the patient for intensive therapy. Due to our distance from hospitals, we refer these patients.

It is our custom to have the patient's family notify us when she thinks that she is in labor. We occasionally are alerted without basis, but not more often than the other false labors. This early notification enables us to be near the office if we are called for delivery, or to hospitalize several from different points of the compass that are in labor at the same time. Rarely will two deliver at almost the same time in the hospital, but usually there is ample time between patients to properly prepare for the next delivery.

DELIVERY

I feel that proper home delivery demands that the patient be given ample sedation, but not enough to be uncontrollable. We have used the various barbiturates, including nembutal, sodium seconal, delvinal sodium, sodium amytal, and tuinal. I can see little difference in the amount of analgesia and amnesia produced by the various members of this group of drugs. I do not use morphine at all, having seen too many difficult resuscitations while at Vanderbilt, and experienced two myself. I do not use scopolamine as I feel that there is more delirium and lack of control over the patients who have had this drug. During the past year I have used demerol in 100 mgm. doses, every three or four hours on twenty-five patients. Three of these patients have been uncontrollable, all happening within the past two months. They required more chloroform than we wished, but to properly conduct the delivery, it was necessary to completely anesthetize the patient and use low forceps. All of these patients could have easily delivered with a minimum of assistance from the physician if they had been cooperative.

We feel that the patient must be on a bed or table high enough for the physician to work without stooping or cramping himself. Failure to do this may result in a painful

sprained back, and endanger the patient when there is not enough room for necessary obstetrical manipulations. The hips must be over the edge of the bed or table and there must be a rigid support beneath the mattress or padding. We have designed a board which will hold our crutches and can be inserted between the mattress and springs or used on a table, sewing machine, or even an ironing board, to raise the patient to a comfortable working height.

We turn the patient across the bed and put her feet in chairs if we are rushed and cannot take the board with us. We never deliver one in the middle of the bed, unless caught by precipitate labor. I do almost as many home deliveries on the kitchen table, as on the bed.

Each delivery is done as a sterile procedure, preparing the field with a mercurial antiseptic and draping the patient with sterile sheets. It is peculiar that there are many rural patients who will not be shaved. We do as much as they will allow and thoroughly scrub the vulva with soap and then the antiseptic. The refusal to be shaved has to do with local superstition and religious belief. We use two thicknesses of sheets to drape our patients. I still cover the anal region with a towel held with Jones clips, to the leg sheets. DeLee and the Chicago Lying-In group feel that this towel is best omitted, but frequent changes of a possibly contaminated towel makes me feel better than to leave this region exposed. It also helps convert the patient who does not wish to be exposed.

We use the regional block technic, which will be shown during the meeting. I carry my novocaine or procaine in the form of a 1 per cent solution in a 60 cc. bottle. We make and sterilize this in the office. At the delivery, after the procaine solution has been poured into the container from which it is used, we add 5 drops of 1:1000 epinephrine hydrochloride solution to each 30 cc. of procaine.

I first block the small sciatic at the ischial tuberosity, then go back to the ischial spine for the branches of the fourth sacral. The same skin wheal serves to block

the anterior branches about the clitoris, by directing the needle upward, through the labia. I use approximately 60 cc. of 1 per cent procaine in each delivery. I also infiltrate the episiotomy line.

This anesthetic allows us to do any sort of operative procedure that we wish, except versions. There is a varying amount of alleviation of the abdominal pain, but the backache is usually completely relieved. After full dilatation, the patient often requests that the supplementary inhalation anesthetic, usually chloroform, be omitted. We do not hesitate to do low forceps and episiotomy whenever we feel that the mother will be less fatigued or that the baby will have less trauma. The episiotomy is repaired in layers with No. 1 or 2 chromic catgut. The most important thing is to close the vagina water tight, to prevent the lochia from leaking into the wound. It goes without saying, that the fascia and muscle are approximated anatomically.

Immediately after delivery of the head, we give 1 cc. pitocin, intramuscularly. As soon after the baby is delivered as possible, we give 1 cc. ergotrate intravenously. I have found that this conserves maternal blood, even if there is occasionally prolonging of the third stage to fifteen or twenty minutes. This is not original with me, but is valuable. I do not hesitate to use a second dose of either pituitrin or ergotrate if bleeding is not kept down to 50 to 200 cc. More than this I consider abnormal.

We also suction the posterior pharynx and upper larynx with a DeLee tracheal catheter and trap. The cord is tied twice and carefully checked before a dressing is applied to be sure that there is no oozing. I have left hemostats on until the cord dropped off rather than risk umbilical hemorrhage. We have never lost a baby, that we delivered, from umbilical hemorrhage. Several have died from this cause in a local hospital. We feel these to be tragic and unnecessary deaths.

SUMMARY

Our results are summarized in the tables. You will note that I have not delivered these women without a death. I have not had a death where I could obtain the cooperation

of the patient. I especially wish to stress that we have had no breakdowns of episiotomies that were done in the home. Two did have separation of the crown suture with slight widening of the skin incision, but no separation of the underlying tissues. Two done in the hospital had the same result, and two hospitalized patients broke down completely; one was mine, the other my associate's.

MATERNAL MORTALITY

Toxemia, undelivered	2
Toxemia, after section	2
Pulmonary embolus (16 days portpartum)	1
Exhaustion and shock (Scheduled for section, but refused and was treated by another physician and midwife until patient was dying) ..	1

Only two patients seen before delivery. The last, and one toxic section, who refused to follow orders.

INFANT MORTALITY

STILL BORN

Over-large infant (13½, 15 pounds)	2
Maternal syphilis (Before prenatal Kahn Law) ..	2
Toxemia, maternal	2
Twisted cord, one of monomniotic twins	1
Placenta praevia, with premature separation (1000 cc. blood loss before calling physician) ..	1

BORN ALIVE

Unexplained neonatal	1
Prematures	8
Cerebral hemorrhage	1

FORCEPS

Low	163
Mid	2
High	3
	169

No fetal deaths attributable to forceps.

EPISIOTOMIES

Home	75
Hospital	30

BREAKDOWNS

Home (Crown stitch separation only)	2
Hospital (complete)	2

ANESTHESIA AND ANALGESIA

Chloroform alone	163
Chloroform and barbiturate	133
Chloroform and demerol	25
Chloroform and barbiturate and/or demerol and procaine block	237
Home	68
Hospital	23
	—
	91

Total deliveries649

Maternal deaths	6
Infant deaths	17
Breeches (no deaths)	11

CORONARY ARTERY HEART DISEASE*

D. D. WARREN, M. D.

WACO, TEXAS

I do not propose to discuss before this meeting of general practitioners all of the diseases which might affect the coronary arteries. The coronary arteries are subject to all the diseases of arteries as anywhere in the body and I do not believe it would be profitable for a group of general practitioners to spend a great deal of time reviewing the experimental work which has been done on the pathogenesis of coronary artery disease. This work is exceedingly interesting to all of us, and particularly interesting to me are the experiments of Leary working with rabbits, and more recently of Herrmann working with superannuated hens, showing the relationship between high-cholesterol, high-fat diets and the production of coronary atheromatosis. Even more interesting is Herrmann's belief that atheromatosis might be checked or even reduced by the feeding of low-fat diets. As interesting as all this work is, however, I believe we could more profitably spend our time today discussing those conditions resulting from a decrease in the amount of blood flow through the coronary artery bed, or coronary insufficiency.

CORONARY INSUFFICIENCY

Coronary insufficiency may be acute or chronic. If the artery is occluded suddenly, infarction of the muscle supplied by that artery might follow, or it might not. If infarction does occur, it might be accompanied by excruciating pain and shock, or there might actually be no symptoms at all. When first discovered infarction was thought to be almost invariably followed by death. There are now many cases on record in which a previous infarction is discovered at autopsy with an absolutely negative history.

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ATHEROMATOSIS AND ARTERIOSCLEROSIS

I would like to make a distinction between atheromatosis and arteriosclerosis. I am quite sure that most of us have gotten into the habit of speaking of these two conditions as one, but atheromatosis is a collection of cholesterol in the intima or subintima of the vessel and is usually found in middle aged men. Whereas, arteriosclerosis is a proliferation of the media and hardens the artery preventing its widening and is more often found in aged persons. Just what the exact relationship between these two conditions, I do not know, but the symptoms resulting from each and the management of these conditions is a little more clear. As I said, coronary atheromatosis is a disease of middle age and found in men over women by three or four to one. This is the disease which kills more young doctors, that is, doctors about my age, than all other diseases combined. It is the most dramatic of all heart diseases. A typical case would be a doctor about forty years of age, perhaps a little thicker in the mid section than when he was a medical student, who has had a good day in the office, and by a good day I mean a busy one, who had a nice supper, played a couple of rubbers of bridge and then retired early in preparation for another good day in the office. About 2:30 in the morning he is seized with excruciating substernal pain radiating into the neck and arms and accompanied by dyspnea. His 75 year old senior partner is called and finds him in agony. He is covered with a cold sweat. His color is ashen gray. His face is anxious. His blood pressure is at first 190/100, later it is 90/70. Morphine is given and he is rushed to the hospital. He has a 20 per cent chance of not recovering from this attack, but if he does recover he has a good chance of returning to his practice and leading a normal life after a period of from thirty to ninety days. Remember though, I said normal life, not average. This then is a typical picture of acute coronary occlusion followed by myocardial infarction. Let's see now if we can picture what happens to the 75 year old senior partner. He, of course, has senile arteriosclerosis. He too,

had a busy day in the office, in his slow methodical way, but being the senior partner he takes the afternoon off, and after a heavy midday meal he strikes out to the farm. He leaves his car at the big gate and starts over the new plowed ground to have a talk with his hired hand. He hasn't gone very far when he begins feeling a dull aching or burning, squeezing pain beneath the sternum which grows in intensity the farther he walks, and extends down the inner surface of the left arm to the wrist. He stops and stands still for a minute or two and the pain disappears. He then proceeds only to have the pain return. He becomes a little aggravated at the inconvenience this time and reaches in his pocket for his nitroglycerin tablets. He isn't at all alarmed because he has known his condition for ten years and has carried nitroglycerin all that time. The pain being relieved by the nitroglycerin he completes his mission and keeps his mouth shut about his symptoms. He finally dies at 92 in a fit of anger because some young upstart has tried to tell him how to practice medicine.

DIFFERENTIAL DIAGNOSIS

Between these two extremes of coronary heart disease there are cases resembling almost every disease of the chest and upper abdomen, neuritis, and myositis, and arthritis, and even toothache in the lower jaw. I have seen two cases who had all their lower teeth extracted when the pain was actually the result of coronary heart disease. And I still get red in the face when I think of the case that I treated for four days as coronary heart disease, and then on my fifth daily visit the patient called my attention to a string of pimples extending around his left chest and asked me if I didn't think it was shingles. I thought it was. I then tried to explain to him how I made the error in diagnosis. The inverted T-waves in leads 1 and 4 of the electrocardiogram, which I at first interpreted as being the result of recent myocardial damage, I now realized were the result of an infarction which he had had perhaps ten or fifteen years before. As I had been an aluminum ware salesman in my student

days, I got my point over and everyone was happy except me. As for me, I went away wondering why I could not remember all the things Dr. Bamber had taught me.

Ruptured duodenal ulcer, gallbladder disease, diverticulosis, and diverticulitis of the esophagus, hiatus hernia, dissecting aneurism, particularly if it is around the root of the aorta, spontaneous pneumothorax are other conditions which must be kept in mind. I have even seen coronary heart disease confused with renal colic in a case in which, for the first twelve hours, all the symptoms were in the epigastrium. Of course, the electrocardiogram is useful in differential diagnosis, but I want quickly to emphasize that it must not be depended upon entirely either to confirm or deny that the symptoms are the result of coronary heart disease. There are many other conditions giving abnormal electrocardiograms, and there may be cases of coronary heart disease with a perfectly normal electrocardiogram. And as was the case in my man with the shingles, the abnormality in the electrocardiogram may be in no way related to the present symptoms. It might be the result of previous disease. Serial tracings, of course, in such a case, are quite helpful. All of the instruments of precision are helpful and should be used if possible, but I am afraid there is a tendency to place too much reliance on them. My plea to general practitioners is not to send a case to the electrocardiographic department of some hospital and then rely entirely on their diagnosis. Their interpretation of the electrocardiogram is only a part of the diagnosis. It is not a final diagnosis. The tracing was made by a technician. The interpretation was made by a physician, who very often has never seen the patient or heard his story. The final diagnosis still rests with you. There are no short cuts to diagnosis. Nothing will replace a careful history and a careful examination of the patient. In these chronic cases of cardiac pain, a second or third history will frequently bring out symptoms that you did not know existed. I have seen patients who on the first visit would tell me that they had

no pain at all, had never had any pain and then at a later visit would give me a typical history of angina pectoris. The pain of angina may be localized in any portion of the upper body, even in the back of the neck, and nowhere else, as was true in one case related to me by Dr. Bamber. This particular man had been labeled a neurotic by some of the best clinics in this country for two years before the diagnosis was finally made. Most of the errors in diagnosis are made because the diagnosis is made too quickly and too positively. Don't allow the patient or the family to push you into a diagnosis prematurely. In a chronic case there is no need for hurry. In a critically ill patient, in shock, take care of your patient as you would of any critically ill patient in shock and don't be forced into a diagnosis the first few minutes you see the patient. After emergency care has been given then review in your mind all the conditions which could cause the train of symptoms of which the patient complains and do what is necessary to rule them out. This doesn't mean that you have to delay a ruptured gastric ulcer until it is too late for surgery, but it does mean that you shouldn't allow an acute myocardial infarction to go to surgery for ruptured peptic ulcer. There may be an immediate temporary rise in blood pressure following acute infarction which is followed then by a drop in blood pressure. Frequently, this drop is rapid and progresses to a critical level in cases of shock. The electrocardiogram may show no immediate changes. Serial electrocardiograms in questionable cases are quite valuable. The infarcted area bulges in systole, but you cannot demonstrate this unless you have access to roentgen kymography. The rise in leukocytes and the fever might or might not help in the differential diagnosis. Most of you, I am quite sure, are familiar with the typical electrocardiographic findings. If you are not, I will simply refer you to one of the excellent text books on the subject. I want to caution you one more time, however, not to depend too much on the electrocardiogram.

TREATMENT

Rest still has the number one place in the management of coronary heart disease. Angina pectoris does not require complete bed rest. It does require a reasonable reduction in activity. Many physicians who have had angina pectoris for ten or fifteen years are still in active practice, but they take their time and rest frequently, particularly in the afternoons, and they avoid difficult obstetrical cases or give up obstetrics completely. Exercise up to tolerance is probably beneficial in angina pectoris because it promotes the development of collateral coronary circulation. Overanxious patients are prone to want to go to bed when you make a diagnosis of angina pectoris. Others do not want to reduce their activities at all. You have to talk straight from the shoulder to this type. Both types are equally difficult. The first, if you tell him too much, you'll scare him to death. The second, if you don't scare him, he'll go on and die. The general practitioner has a tremendous advantage over the consultant in the management of individual cases, because he is familiar with the temperament of each patient and knows just how much to say and when to stop. A case of myocardial infarction requires on an average of four weeks of complete bed rest. Perhaps it is better to say, complete rest, because it is not necessary sometimes that they remain absolutely in bed. These patients frequently do just as well sitting in a chair and using a commode instead of a bed pan, particularly after the pain has disappeared and after the temperature has returned to normal. If a patient has to be kept in bed too long there is danger of thrombophlebitis and pulmonary embolism. In these prolonged cases, the legs should be gently massaged in an effort to prevent thrombosis. I think enough has been said in the past few years on the dangers of bed rest and I do not care to emphasize this point too much. Bedrest is still important to a real sick patient.

As to diet, in the acutely ill patient the diet should be liquid in the beginning to be followed later by a very light diet, relatively high in carbohydrate, if diabetes does

not exist, and low in fats. For the follow-up diet I have recently been using the low-fat, low-cholesterol diet recommended by Herrmann. I do not know whether the low-fat diet has any influence on decreasing the atheromotosis, but I can see no harm in it and I have had little difficulty in getting patients to follow it, except my obese patients who need it much. A reduction in weight in obese patients with coronary heart disease is important.

In acute infarction, particularly if dyspnea is present, oxygen is helpful and should be used if available. Occasionally you will find a patient so frightened by the oxygen that I believe its use should not be insisted upon.

Tobacco should certainly be prohibited after acute infarction, and in younger individuals, but when a man is 75 years of age, I, for one, am not going to stop his smoking because of angina pectoris. I do attempt to get him to smoke moderately.

Alcohol is frequently useful in controlling the pain of angina pectoris, particularly in those cases who run a low blood pressure. I have found it particularly helpful in those who have an empty stomach when the pain comes on. I have found it most useful in elderly people whose pain is felt at night. Its use, however, as a beverage, should not be encouraged. In this respect I heartily disagree with recent advice. In my experience, at least, it leads to overeating and other excesses. Nitroglycerin is the drug of choice in angina pectoris; 1/200 grain under the tongue will frequently give relief without the side effects of pounding in the head and headache. Many of my patients, particularly elderly men, have found that by the use of nitroglycerin they can do chores that they otherwise could not do. I do not advise its use in this way but if the man has some strain coming up which he cannot avoid, then I do advise him to take a prophylactic dose of nitroglycerin.

Papaverine, in a half to a grain and a half dose every three to four hours is helpful in some cases, and niacin in 25 mg. doses repeated every three to four hours is

useful in some cases. For prolonged cases theocalcin by mouth might be beneficial and can do no harm if it does not cause nausea. Morphine, of course, is the drug of choice in acute infarction and should be given promptly and in adequate amounts and intravenously if possible.

As to dicumarol and heparin, I have not had sufficient experience with them to give a personal opinion. The literature would indicate that both have a useful place in the prevention of emboli, but neither should be used unless you have your patient hospitalized, where the prothrombin time can be carefully checked. They are dangerous and should not be used except under careful control.

Quinidine should be used in all cases showing any change in mechanism. Even in cases with ectopic beats I believe quinidine should be used. In these cases I give from 3 to 5 grains three to four times daily. If ventricular tachycardia is encountered, 3 grains should be given every hour until the mechanism returns to normal or until a total dose of 36 grains is given. If it does no good in that length of time, the chances are that it will not do any good. If congestive heart failure develops in a case of coronary occlusion, even in the early stages, digitalis is required just as it is in any other heart failure.

Small transfusions and glucose intravenously are helpful in cases of shock, but care should be taken when intravenous fluid is given not to bring on pulmonary edema. If pulmonary edema develops, coramine intravenously has seemed to me to be beneficial. Adrenalin has no place in the management of coronary heart disease.

If heart disease in general is captain of the men of death, and we all now know that it is, then coronary heart disease is captain of the men of death for middle aged men, but this does not mean that we cannot give our coronary cases a word of encouragement, and we should give them encouragement but with caution. In the case of a physician, I believe it is safe to say that 80 per cent of those having myocardial infarction can look forward to returning to an

active useful life in the practice of medicine, but moderation must be the keynote of their way of living. There is no way of telling which case of coronary heart disease will die and which will get well. In a general way, the more severe the initial shock the greater will be the incidence of death, but on the other hand I have seen patients who had no shock die precipitately from a change in cardiac mechanism, perhaps ventricular fibrillation. I am a believer in disability insurance but I have seen many men whose lives have been made miserable by the collection of disability insurance following coronary occlusion. Do not declare a physician totally and permanently disabled too soon.

CONCLUSION

In conclusion I want to emphasize again that a careful history and careful examination is still of prime importance in the diagnosis of coronary heart disease and no instrument will ever replace either, important though these instruments might be. And in the care of coronary heart cases, no man should be better prepared than the general practitioner. A careful understanding of the patient's temperament is most important, and in this respect the general practitioner has a marked advantage over the consultant. I hope I am not leaving the impression that the consultant is not to be consulted very often, but when you do send a patient in do not ask for an electrocardiogram and expect a complete diagnosis.

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ETHICS IN MEDICAL PRACTICE*

KING RAND, M. D.

ALEXANDRIA

May I express my gratification for the privilege of addressing this, the first meeting in the nation of the Academy of General Practice, and to congratulate you on your society, the eligible membership of which hitherto has constituted the great body of American physicians, unorganized and inadequately recognized within and

*Presented at meeting of the Louisiana Chapter of the American Academy of General Practice, Alexandria, Louisiana. April 3-4, 1948.

without the profession. Until today your only common tie was a membership in your component State Society and the American Medical Association. Those devoting their time and talents to a limited sphere of medical activity have long enjoyed the advantages of restricted grouping. Your action is opportune. As an outsider I would like to acknowledge the esteem and respect in which you are, or should be, held by all members of the profession. You are the foundation of the profession. To serve, you must possess the fundamentals of all medical knowledge, confessedly inadequate, for no human mind can grasp and retain all known facts of the art and science for the practice of medicine, but yours is the task to recognize disease, to recognize it early, and direct its course to a happy termination, by your own skill or that of one devoting his attention to the limited sphere of medical activity—the specialist, who for obvious reasons, may or should be more capable of handling the specific case. The truth of this statement you likely recognize and acknowledge. Its vindication each of you has experienced in attending scientific meetings where the essayist emits the fundamental fact that it is the duty and responsibility of the general practitioner early to recognize disease, whether it be cancer, tuberculosis, a faltering heart, a surgical emergency, or what-not in order that the patient may receive the early indicated medical and surgical care. Yours is, indeed, a task worthy of your talents. More might be said on this subject, but this is not the assignment for the occasion, which is, namely—ethics.

The Greeks had a work for it, meaning "character," and though defined by many minds in many ways, the common and essential interpretation is the employment of the principles of right conduct, executed to some extent to the letter, but more essentially executed in the spirit. Where people gather together rules of conduct become necessary. When the practice of medicine emerged from the mystics, ethics slowly took form as the child of observation and deduction, a process of cen-

turies. We have our first documentary evidence in the principles enunciated in "The Oath of Hippocrates". Expressed in the American language, he admonished you to be a loyal alumnus; to share your medical knowledge and experience with your fellow practitioners; that the patient is the all important individual, demanding and deserving your best skill and attention; that you never have the choice of life or death with the born or unborn; that you do not attempt that which is beyond your capacity and ability, but should call in your more experienced brother; that you must not be too familiar with your patients; to learn to keep your mouth shut concerning your patients' troubles, the first enunciation of privileged communications, and then summarized the whole spirit of the document by stating that in observing these things "May it be granted to me to enjoy life and the practice of the art respected by all men and all time." There is no certainty that he wrote this document, though he is generally given credit, and it has been said that if he did not write it, he could and should have—it is in his style. Do not hold him too lightly. He knew more medicine than you think. He lived in the times of Socrates, Herodotus, Aristotle, Plato, and other mental giants, a period of which it has been said that never before or since have so many men of genius appeared in the same space and time. Whom do you know in modern medicine who will be commented upon at a medical meeting twenty-three hundred years from now?

We will rapidly skip along and let you peep at the physician of the Middle Ages. He is instructed as to bedside manners, to approach the bedside *humili vultu*, which might be translated by the picture of a slightly experienced bride putting on a show of exaggerated innocence on approach to the nuptial couch. He was always to regard the present case as grave—heads I win, tails you lose. If the poor devil lived the medico was a good therapist; if he passed on then his gift of prognosis was vindicated. While in the home, he should

not ogle the patient's wife, daughter, or maid-servant, and thus diminish his professional credit. Harmless remedies were permissible so that the patient might believe he was getting his money's worth, while normal recovery by the healing powers of nature might injure the physician's therapeutic reputation. People back there didn't always pay their bills either, and there was complaint from the doctor, one of whom suggested that the ungrateful convalescent might be temporarily sickened by some harmless dosing. *Times Marches On!* Somehow, there is something familiar in this picture of the doctor's conduct in the Middle Ages.

A consideration of the history of the professional moral conduct since the founding of the republic to the middle of the 19th Century reveals that rules governing such conduct were local in scope, covering the community or city. There was no accepted code for the profession as a whole. About one hundred years ago, in 1847 to be exact, the American Medical Association was organized, a central body, national in scope, giving expression and publicity to national professional opinion. Among its earliest endeavors was the crystallization of the principles of ethical conduct. It has not varied its purpose to date, working with the realization that professional ethics are necessary for the protection of the public and the sick against ways of unscrupulous physicians; that rules and ideals are necessary in the relationship of one physician to another. The problem has become more complex as has the practice of medicine become more complex. Its published code of ethics cannot be exhaustive or all inclusive, but the general principles verily covereth a multitude of sins. A few of these principles bear scrutiny.

First, never in the presence of a patient, or to a patient, criticize the work or acts of another physician—you were not there, brother—you do not know the circumstances, and you do not know what you might have done. In medicine one frequently, very frequently, too frequently, has to

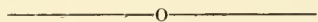
act now; not like his friend, the lawyer, take it under advisement and come back next week. And besides, the patient frequently gives the wrong picture, omits essentials and relates half truths. Remember, too, you are not so perfect as to be devoid of faults. Experience teaches us that many malpractice suits are precipitated by thoughtless remarks, unfair remarks of one physician about another. Of all people in the world, you should realize that silence so frequently is golden, and criticism as frequently unkind.

Do not let your enthusiasm get the better of your judgment. Better to lose a patient to the other fellow than forget the basic principles of professional courtesy. In conduct the physician and gentleman should be synonymous, remembering always that the profession is judged by the acts of each and everyone of you individually. It is not that a man, but that a physician, did so and so.

Do not, unknowingly to your patient, indulge in financial manipulations to your advantage. Do not accept rebates of any kind; your patient pays for it unknowingly, and this constitutes unlawful and unethical conduct. Admittedly, the fees receivable are not always equitable. Frequently, as general practitioners, your remuneration is not commensurate with your services, yet you cannot afford to transgress the basic principles governing the situation. The patient pays the freight. He is entitled to knowledge, detailed knowledge, of the differential.

It is your duty to conduct yourselves so that you are unashamed, that you may be an ornament to your calling. You need no document by page and paragraph to guide you in your relations with your fellow practitioner. That truth of morals, philosophy and religion is expressed by leaders of men through the ages in different words, but the same thought; "Do unto others as you would have them do unto you." If this be your guiding thought, all physicians, all men will respect you. Life on this sphere

is so planned that you must in the darkness of the night associate with yourself. Let not that wee small voice whisper the disconcerting truth that regardless of how much you know; and how little we do know, that you have needlessly failed to be a *true physician*.



ESSENTIAL CONSIDERATIONS OF THE CHRONIC DIARRHEAS*

JOSEPH S. D'ANTONI, M. D.

NEW ORLEANS

I am particularly glad, for two reasons, to be able to discuss the chronic diarrheal diseases before a group of general practitioners. The first reason is the obvious one that general practitioners exert more influence diagnostically in all diseases, and exert more influence psychologically from the standpoint of their relationship to their patients, than any other physicians. My second reason is that almost no other group of diseases is more grossly mismanaged than the chronic diarrheal diseases.

I do not think I am guilty of exaggeration in this generalization. The proof of the statement is apparent. The chronic diarrheas are mismanaged because diarrhea is regarded as a clinical entity rather than as a symptom for which a cause must be sought. The *symptom* is fairly easy to control, at least transiently, by rather simple measures. Its *cause* is frequently difficult to identify. Etiologic diagnosis is a laboratory matter which calls for special techniques. The search is usually long and tedious and it is often unrewarding. The treatment of the causative disease is always long and tedious. Under these circumstances it takes considerable strength of character on the part of both physician and patient to undertake the required diagnostic and

therapeutic routine. There are, however, no short cuts to either diagnosis or treatment, and it is the attempt to take them which is chiefly responsible for the mismanagement to which patients with these diseases are so often subjected.

The general practitioner, as I have said, has an important role in the recognition of the chronic diarrheas, since he is most often the first to point the finger of suspicion at them. He cannot avoid encountering them. Their incidence is very high. These diseases affect all groups and classes. Their spread is favored by the poor hygienic habits which so often go hand in hand with poverty, and their frequency therefore decreases as one ascends the social and economic scale, but there is no immunity to them on any level of society or of financial security. That these diseases will ever be completely banished seems doubtful. They can, however, be controlled if physicians and patients alike take the time and make the effort to do so.

NOMENCLATURE

Diarrhea and dysentery, although the terms are unfortunately rather generally used as if they meant the same thing, are not synonymous terms. Diarrhea and dysentery are both symptoms, not diseases. The symptoms sometimes have the same basic cause but they are essentially different from the standpoint of severity. Diarrheic and dysenteric stools are alike in that both are unformed and both may contain mucus, pus, and blood. They are essentially different, however, in that a diarrheic stool, whether the diarrhea is acute or chronic, is chiefly fecal in composition. A dysenteric stool, on the other hand, contains little or no fecal matter; it always contains cellular debris, and its passage is usually associated with tenesmus.

From the standpoint of the patient, diarrhea represents a departure from the normal bowel habit manifested by an increase in the number of stools or by a change in their characteristics, or by both alterations. Diarrhea is entirely a relative matter. What one person, accustomed to a certain daily bowel habit, would classify as abnormal,

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another, whose normal habit is to pass two or more semi-formed or soft stools daily, would not consider abnormal at all. A dysenteric stool, on the other hand, is not a relative matter. It would be considered abnormal by any patient, no matter what his usual bowel habits.

The classification of diarrheal diseases into acute and chronic has to do with the duration of the disease. It has nothing to do with the severity of symptoms. For the purpose of this discussion a chronic diarrhea may be defined as any diarrhea which is continuous or recurrent and which has lasted longer than a month.

ETIOLOGIC CONSIDERATIONS

My own practice, which is confined exclusively to diseases of the colon and is largely consultative, indicates that amebiasis, shigellosis and brucellosis account, in that order, for two-thirds to three-quarters of all the chronic diarrheal diseases. Shigellosis in its acute and chronic forms greatly exceeds the incidence of the dysenteric form (*Shigella* dysentery). Brucellosis is becoming increasingly important as a major epidemiologic problem in the United States, though in its intestinal variety it is not always recognized. In my own practice, over a five-year period during which no special attention was paid to it, I recognized brucellosis as the cause of chronic diarrhea in only five instances. Over the next eighteen months, when I was looking for it, I identified it in 26 patients. I now find it in 5 or 6 patients with chronic diarrhea every month.

Diarrhea caused by giardiasis is not common. Schistosomiasis is not a significant cause of diarrhea in the United States. Strongyloidiasis is an important intestinal disease, but its incidence is low and it is therefore not a frequent cause of diarrhea. Lymphopathia venereum and chronic intussusception are beyond the limits of this discussion. Malignant disease is also beyond these limits, but the warning cannot be too often repeated that a possible malignant origin must be in the background of the physician's consciousness whenever he encounters diarrhea, especially when he is

dealing with patients over 40 years of age and especially when there is blood in the stools which cannot be explained. Under these circumstances a digital rectal examination, a sigmoidoscopic examination, and a barium enema are always indicated, even if causative parasites have been identified in the stools or in aspirated material from the intestinal tract.

CLINICAL MANIFESTATIONS

The symptomatology of the three most important causes of chronic diarrhea, namely, amebiasis, shigellosis, and brucellosis, is remarkably similar. All three diseases are manifested by such symptoms and signs as vague complaints referable to the abdomen, nervous irritability, easy fatigue, low-grade fever, vague muscular and arthritic pains, and similar indefinite complaints. Both shigellosis and amebiasis may be characterized by regularly intermittent diarrhea associated with malaise and lasting for periods of twenty-four to thirty-six hours. These episodes are sometimes severe enough to require bed rest. If arthritic symptoms are part of the clinical picture, they are likely to be exacerbated at these times. The acute episodes have a notable—and inexplicable—seasonal incidence. In New Orleans they are likely to occur between April 15 and June 15 and between August 15 and October 1.

The character of the symptomatology in amebiasis is related to the location of the infectious process. Amebic infections are most frequent in the cecum, where they take the so-called syndromic form, that is, they simulate such intra-abdominal diseases as peptic ulcer, chronic appendicitis and cholecystitis. In the cecal form of amebiasis, constipation, not diarrhea, predominates. When, on the other hand, the infection is localized in the rectosigmoidal area, the disease takes a dysenteric or diarrheic form, which may be either acute or chronic.

The passage of cysts, not of trophozoites, is the rule in cecal amebiasis and the general belief that they are of no importance and cause no symptoms is completely unjustified. The great majority of American protozoologists take the position that *Endamoeba histolytica* is a tissue parasite, not

an inhabitant of the intestinal lumen. The carrier concept therefore is entirely erroneous. In this disease tissue parasites are always pathogenic and are never innocuous. Moreover, patients who are neglected or badly managed, or whose resistance for any reason is lowered, may progress from subclinical amebiasis to more serious forms of the disease. Dysentery may develop and may be followed by intestinal perforation, ameboma, hepatitis, liver abscess, and involvement of other organs and systems.

I have recently found that amebiasis not only occurs in children but is by no means infrequent in childhood. The clinical picture, which differs from that observed in adults, has four outstanding characteristics: (1) The complexion has a peculiar muddy, yellowing tinge, which sometimes suggests fading sun-tan. (2) The liver is enlarged and tender. (3) Personality changes are notable. (4) The appetite is capricious; it is usually poor but it may be insatiable.

Constipation is frequent in amebiasis in children, but diarrhea may occur and mild dysentery is occasionally observed. Other symptoms include occasional nausea and vomiting, low-grade fever, headaches, easy-fatigue, increased susceptibility to colds, mild abdominal pain, muscular pains, and mild convulsive seizures of no recognizable pattern.

In the more than 200 cases of amebiasis which I have observed to date in children, the explanation of the occurrence of these symptoms—though not of their pattern—has invariably been the same: The parents, or others in close contact with the children, have had amebiasis which was usually not suspected but which was undoubtedly transmitted to the children.

Patients with disease of the colon, regardless of origin, have usually undergone personality changes, their nervous status being in no wise improved by the fact that their complaints have been diagnosed under a wide variety of syndromes and treated by a wide variety of methods. Neurosis has frequently been the final verdict, on the

ground that such variable symptoms could not possibly arise from a single pathologic basis. The proof that they can so arise, however, is two-fold, (1) the identification of the causative organisms in the stools in shigellosis and amebiasis, and diagnosis by other methods in brucellosis, and (2) the results secured by adequate treatment. I should be the last to deny the association of a chronic anxiety state and chronic disease of the colon, but my own experience is that the patient who is thoroughly investigated will usually be found to present a sequence of colon disease-anxiety state and not the reverse.

DIAGNOSIS

When I emphasize that the etiologic diagnosis of chronic diarrhea is a laboratory procedure, I do not, of course, mean in any way to minimize the importance of the history and physical examination, particularly of the history, in the diagnostic routine. A history which brings to light nothing at all still has a negative value. Occupation, dietary habits, possible food idiosyncrasies, the source of the milk ingested, places of residence, military service, the relationship between the symptoms and the physical and emotional state, these and other data may all provide information which will save time, trouble, and expense in the establishment of the diagnosis. An inquiry into the bowel habits of the remainder of the family should never be omitted, even when hygienic practices may be assumed to be good. Indeed, the information secured about other members of the family may be more revealing than the patient's own history.

Another consideration which cannot be too strongly emphasized is that if the physician relies on diarrhea alone to make him suspect intestinal parasitic disease, he will miss more than half of all patients with amebiasis; constipation and not diarrhea is most often the dominating intestinal symptom in this disease. In shigellosis, furthermore, less than a third of all patients are likely to have a previous history of dysentery, though careful inquiry will usually reveal previous abdominal complaints, often little more than vague discomfort, but still

sufficient to justify the assumption that one is dealing with long-standing, low-grade intestinal infection.

My own laboratory routine, evolved from a long experience in which error, I am sorry to say, was often prominent, is now as follows: In addition to urinalysis, blood studies (including mean corpuscular blood volume determinations to eliminate the sprue syndrome), gastric analysis to eliminate achlorhydria, and other routine tests, it includes: (1) examination of aspirated material secured by sigmoidoscope, and of purgative and enema specimens, repeated once or twice at five to seven-day intervals if the examination is negative; (2) culture of aspirated material and of enema specimens for *Shigella*; (3) agglutination, intradermal, and sensitivity tests for brucellosis; (4) the Frei test in patients suspected of having lymphopathia venereum.

The secret of diagnostic success in the intestinal parasitic diseases is twofold,—the services of an experienced technician, and repetitions of the various examinations. In my own experience the average number of cultures necessary for the diagnosis of shigellosis is five and I have made as many as twenty in a single case.

One final warning must be issued concerning the diagnosis of the chronic diarrheas: More than one type of intestinal infection may be present in the same subject. Amebiasis may coexist with shigellosis or with brucellosis, or there may be other combinations of diseases. A multiple infection should therefore be suspected whenever a parasitic intestinal disease is refractory to treatment which is ordinarily effective.

THERAPY

Details of the therapy of the chronic diarrheal diseases are naturally not possible in a presentation of this sort, but general principles may be stated and certain facts may be emphasized. The outstanding consideration is that every patient with an intestinal parasitic infection should be treated. This is particularly true of amebiasis, which is not a disease to be ignored with safety. The patient is a source of danger to others, and from his own standpoint, if

he is not actually ill, he is in a state of sub-clinical ill health from which serious complications can arise. Often he does not realize that he has not been perfectly well until the infection is controlled and he experiences the improvement in health and well-being which follows.

The bacterial types of diarrhea (shigellosis and brucellosis) as well as undiagnosed colitis are benefited by certain general measures, which should be instituted along with amebicidal therapy. The Jones sugar-free diet should be strictly adhered to until improvement in symptoms occurs. Then articles from a list of permitted foods are added one at a time and in quantities so large that if an idiosyncrasy to them still exists, it will be demonstrated at once. If sensitivity no longer exists, these articles can be eaten in the usual quantities. A second general measure is the administration of a multiple-vitamin preparation of high potency, since the patient with a diarrhea which has lasted as long as ten days is likely to present at least a borderline avitaminosis.

Neoprontosil is an effective antidiarrheal drug, its effect probably being on the associated pyogenic infection rather than on the amebic disease per se. Sulfadiazine and penicillin are also useful in the control of secondary infection.

Chloroquin (Aralen) in doses of 500 mg. twice a day, for five to ten days has been suggested by Conan in a recent issue of the *American Journal of Tropical Medicine* as quite effective in hepatomegaly and hepatitis of amebic origin, and it may be equally effective in liver abscess. In my own hands it has given better results than emetine hydrochloride in these special circumstances. Emetine hydrochloride has a sharply limited field. In intestinal amebiasis its curative properties are probably less than 30 per cent, though it is extremely useful in both dysentery and diarrhea and is the only drug effective in ameboma. It should, however, be used with the greatest care, since it is a protoplasmic poison and is potentially toxic. I have seen patients develop such severe symptoms following its

use that they had to be rehospitalized. It may be that the dosage generally used at present (a total of 10-12 gr. in daily dosages of 1 gr.) is too high. Sodeman has recently suggested a dosage of 1 mg. per kilogram of body weight daily for ten days; the suggestion seems rational and the dosage safe.

At the present time no safe and effective amebicide is available for general use. Up to two years ago I would have said that diodoquin met the requirements, but over this period, probably because of manufacturing difficulties, the results secured with it have been highly unsatisfactory. I am now testing three new drugs, which apparently are giving good clinical response as well as a high rate of cure, but I am not prepared to make definite statements about them at this time.

In evaluating the therapy of amebiasis it must be borne in mind that symptoms do not disappear until some time after parasites have disappeared from the stools. Posttreatment episodes, however, become successively milder until they eventually cease altogether, and therapy should not be reinstituted unless parasites reappear in the stools.

Shigellosis and brucellosis are both treated with vaccines, administered subcutaneously in successively larger but cautiously increased dosages, preferably at weekly intervals. The amount of the initial injection is gauged by the size of the skin reaction.

Shigellosis is treated by an autogenous vaccine made up as soon as the organism is isolated. Brucellosis is treated by the Melitensis-bovine-porcine (MBP) vaccine of Castañeda. In both diseases the patient is kept under careful observation and is strictly individualized. All phases of the response to the previous injection are checked before each subsequent injection, and it is the invariable rule to employ a smaller dosage whenever there is any doubt as to the wisdom of an increased dosage. Dangerous reactions, and even fatalities, can occur if these instructions are not strictly followed.

The patient to be treated by vaccine therapy must understand that this is not a

rapid method of treatment. In shigellosis, results are seldom apparent before six months and treatment must usually be continued for a year or more. In brucellosis, no improvement is likely to be evident for at least ten weeks; six months of treatment is the minimum, and it may be necessary to continue the injections for a year or more. Patients with combined brucellosis and amebiasis will not be benefited by amebicidal therapy, as already pointed out, until brucellosis is adequately treated. Prompt and permanent disappearance of *E. histolytica* from the stools then usually follows a single course of therapy.

SUMMARY

This presentation has been limited to certain outstanding considerations of the chronic diarrheal diseases as they manifest themselves in a practice limited to diseases of the colon. Amebiasis, shigellosis, and brucellosis are the most common causes of chronic diarrhea. Diagnosis and differential diagnosis are laboratory matters and are often tedious and difficult. Treatment covers many months. There are, however, no short cuts to either diagnosis or treatment and good results cannot be anticipated in the absence of patience and persistence.

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PYLORIC STENOSIS AND PYLOROSPASM

C. E. HAMILTON, M. D.

LAFAYETTE

No subject concerns the general practitioner more, when we consider that the major part of general practice deals with children and with babies especially. No condition among babies is more perplexing nor is the urgency greater to relieve, than persistent vomiting, unless it is a depleting diarrhea or dysentery. The prompt recognition and differentiation between stenosis and pylorospasm is vital in the treatment, where time is the factor. We are familiar with the general symptoms of the two con-

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ditions; but it is necessary to recognize a stenosis in order to apply the specific treatment, before too much dehydration and loss of weight result. I shall dwell briefly, and from the point of view of the general practitioner who usually sees these little patients in his office.

PYLORIC STENOSIS

Hypertrophic stenosis occurs oftener in the male and in the first born. There is no definite family connection, though it may occur rarely in two children of the same family. It is not uncommon among cousins, and I have seen it when the mothers are sisters. Stenosis is ushered in by projectile vomiting, and manifests itself as early as the first day of life and of course persists, regardless of formula; however, it usually starts between the second and tenth week. There is constipation, dehydration, failure to gain, or loss of weight. The peristaltic waves are invariably present and, if we are on the alert, we can usually see them. Palpability of the tumor depends upon its size, thinness of the abdominal wall, and the ability and experience of the physician, and when felt, the tumor is more like the eraser on a lead pencil than an olive. Failure to feel it is no reason not to make a diagnosis if the other criteria are present. If you wait till you can feel the tumor, it may be too late. I have missed recognizing the true condition because of this erroneous belief. Whenever it is practicable x-rays of the stomach should be taken, but we are not dependent entirely upon this useful adjunct. Heretofore, I have not considered the delayed emptying of the stomach as important as the other signs described. Recently, however, I read a most informative article in the January issue of *Surgery, Gynecology and Obstetrics*, by Doctors Schaefer and Erbes of Milwaukee, which I recommend to you. It is original as far as I know, simply written, and easy to read and to understand. They describe what is to me a new technic, and claim almost 100 per cent reliability. It consists in the pyloric tumor with the barium meal casting a typical shadow of the stenosed pyloric canal which is long and narrow and described by Hefke as a "prepyloric narrowing" and the

"string sign", because it looks like a piece of string. It is necessary to take the picture obliquely in order to see it. I have had only two occasions to try it and found it to be correct.

I have had 16 cases of pyloric stenosis in my private practice since 1943, which were operated upon by different surgeons, 12 by the same man, with the loss of 1 baby who was moribund before operation. One of the babies had to be reoperated upon a few days later because the first incision of the tumor was not long enough; another baby had the mucosa punctured and developed pneumonia, but recovered. Most of these babies were operated upon under local anesthesia which I prefer; but the success depends also upon proper pre-operative preparation: (1) fluid by clysis; (2) proper sedation with luminal by needle; (3) stomach lavage, leaving the tube in during operation and for twenty-four hours after. I start feeding the babies four hours after operation, but first give dextrose water through the tube which is then clamped. I have not found that it made much difference which milk I used if I was cautious in starting with small quantities. Doctors Barker, Hardy and White of Alexandria have a splendid article on Hypertrophic Pyloric Stenosis in the January issue of the *New Orleans Medical and Surgical Journal*, which I am sure most of you read and enjoyed as much as I did. I agree with Dr. Harris that part of the success of the operation depends upon the teamwork between the physician and the surgeon; and without disparagement of the latter, I think what the physician does before is equally important as the operation in obtaining best results.

I was always curious to know what happened to the pyloric tumor and was fortunate in observing two cases that were operated upon later for something else and there was no sign of it; nor was there any thickening of the muscle nor any induration present. The mere incision of the muscle to the mucosa did the trick and complete absorption took place.

PYLOROSPASM

Pylorospasm is much more common than

stenosis; I do not know what the ratio is, but in my practice it is about 10 to 1. I should like to know the experience of others. Pylorospasm is more nondescript in character than stenosis and we are usually led to recognize it by the mother's story of how many different milks have disagreed with the baby. Well, it's the reverse; the baby disagrees, in a sense, with the milk. The symptoms are those of inability of the baby to retain, and it is not uncommon for each new formula to agree for a few days. The vomiting is not so persistent as in stenosis, nor are the effects so severe for obvious reasons; it is sometimes projectile, which is confusing at times, but this forcible type never persists without remissions. There may be a peristaltic wave from left to right, and naturally, no tumor is felt because it is not present, though I confess to having felt it when it was not there. X-ray, in my experience, here plays a small part, unlike its role in stenosis.

The treatment consists in thick feedings preceded by atropine, with which all of you are familiar. I have not had results as satisfactory, with Eumydrin. I use farina as a thickening agent, in evaporated milk. It does not make any material difference what thickening is used. I remember, in the early days of my practice in the country, "pap" consisting of flour in milk was given by the mothers to their babies that vomited; they did not know, nor did I then, anything about pylorospasm; but country mothers, I have found, are more observant than their city sisters who depend more upon the telephone. I prefer feeding these babies every four hours in order to get in the atropin, as it is not as applicable every three hours. A word of warning as to idiosyncrasy to atropin: Start with a dose that you think is smaller than indicated and increase until effective. I have had some severe cases of atropinism.

At times there is a fine distinction between stenosis and spasm and one is hard put for a decision. I think when there is reasonable doubt and the baby is not losing weight, one is justified in treating conservatively and I have never regretted wait-

ing. I read recently that the tendency in Norway is to treat all cases medicinally; but I do not subscribe to this view because cases of true stenosis will assuredly die if surgical intervention is not resorted to in time.

The general practitioner is the one who sees pyloric stenosis and pylorospasm first and is the one who treats most of the latter. Upon his acumen depend the lives of the babies with the former.

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THE GENERAL PRACTITIONER AND NATIONAL MEDICINE*

ARCHER C. SUDAN, M. D.†

KREMMLING, COLORADO

Today America is the healthiest nation in the world. This is a broad statement and takes in a lot of territory. This is a goal toward which all good physicians and surgeons and decent citizens have been striving for many years. It is an achievement, commensurate with the best of national efforts and accomplishment in industry, agriculture, and other endeavor, and far exceeds that of the many much older nations of the world.

We need to give considerable review and thought to the manner in which this great accomplishment was conceived and brought to reality. The pattern was distinctly American, based upon free enterprise and individual initiative. The policies have been free from fads and unproved speculation and these have grown from successful experiences based upon facts. To attain this status, it was not found necessary to import foreign formulas or ideologies, or methods directly opposed to established methods of American endeavor. Many times, however, a study of conditions in foreign lands, resulting from new schemes dominated entirely by governmental edicts, provided us with caution signs to abrupt

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blind alleys, or trails leading toward disintegration, not toward progress. Those were the days when we had within our governmental agencies, fact-finding research workers, not bureau architects, designers and planners for more bureau power, self-promotion and perpetuation.

This great accomplishment resulted from orderly evolutionary methods and progressed at an equally high plane with progressive attitudes of American endeavor in all aspects of American life. The application of science in the field of medicine has by far superseded public appreciation. We have reached a plane in physical science where we are in danger of blasting from under us the planet upon which we live, or blasting our very existence from the planet. It would make little difference which, if either possibility should prevail. In fact, we have arrived at a plane in science where scientific processes, knowledge, and achievement have reached a point at which relatively few people, if given the power, might through injudicious use of that power destroy all that has accumulated through the ages.

Throughout the annals of medical history, doctors of America have occupied high positions in government, both in the state and the nation. Their expressions, until relatively recent years, have emanated from the councils of all of the doctors in America. Basically, they dealt in the commodity of good health to the nation; they refined this commodity and have constantly sought to make it available to all. This was accepted by business leaders, educators, economists, and all of the good citizens of America, as sound in all its aspects. It was ever enlarging in its scope and useful application. Every dollar spent for this commodity bought a full dollar's worth of health in every community.

In attaining our present status of national health, the doctors of America, and especially the general physician, have played a tremendous role. Except in the metropolitan areas, he has been the main implementing force in the introduction, and in gaining acceptance, of modern public

health measures in his community. The general practitioner has generally been in the foremost ranks of all those best serving his community. The people in his community were well aware and still are aware of the many sacrifices their local physicians have made and how much of themselves they give to the community. The inhabitants of the local area well recognize the many personal sacrifices their physician willingly makes to serve the economically depressed in his area, and they feel his counsel weighty and worth obtaining in community endeavor. Through his efforts and the confidence he has inspired in his community, he has been successful in overwhelming the opposition which was once so prevalent against vaccination, immunization, sanitation, and other desirable health measures.

Rural communities are, therefore, today, better informed in matters of public health and disease than is generally appreciated. This is well demonstrated by the willingness of various lay organizations in every community to participate in fund-raising campaigns of all sorts which have to do with attempts to arrest or abolish disease. Specifically, consider the various amounts of funds raised in your state in the sale of Tuberculosis Stamps, the March of Dimes, cancer-drive funds, funds for Crippled Children, and a number of others—usually every community over-subscribes their allotted amounts. It is further evidenced by the fact that in every state in our nation there have sprouted, in the past decade, numerous voluntary organizations with the avowed purpose of promoting public health. Many of these organizations are worthy and sincere, but because of a deficiency of fundamental knowledge and qualified leadership, their efforts frequently lead to a state of confusion, or toward hampering well-functioning community efforts. Many of these groups, and especially the American Public Health Association, have annual local and regional meetings, becoming ever larger, and as one reviews their programs, he is impressed with the fact that few, if any, Doctors of Medicine are on the

program, or even invited to attend. Doctors of Philosophy and Social Service workers make up most of the program—and when a Doctor of Medicine is on the program, it is invariably someone from the United States Public Health Service, or someone from the State Health Department, who can furnish a lot of mortality and morbidity statistics but no actual summary or even an approach to local area health problems—and when I say local area health problem, I include the prevalence or lack of adequate housing, the number of people living in a one- or two-room shack with its attending overcrowding, the inadequacy of or the prevalence of sufficient proper food, good health education, the adequacy of clothing, sufficient recreation, and such other economic factors which so directly influence good health.

Yes, these lay organizations, and especially the American Public Health Association, and many state Public Health Associations have found people interested in directing their organization—locally as well as nationally. It is a bet at long odds that those in the camp of nationalized medical service have not overlooked. The question is: Should not the doctors of the local areas prevail in informing their local members how their efforts might be well directed toward a solution of their own problems, rather than seeking Santa Claus?

Where this has been done—where leadership has been provided by the local physicians—these organizations, by assuming a better name such as the Health Council of a trade area or county, are in many instances organizing and building their own health units and community hospitals with their own funds. They are not looking for hand-outs from the government. In fact, many of these communities have become aware that funds from Washington are funds or dollars siphoned from the community, or the various communities of the state, in federal taxes of one sort or another—such as a small dig of Milady's face cream, her fur scarf, her telephone calls, her telegram, every cigarette, or chaw of terbakker, every cocktail or bottle of beer,

and a host of other, by now painless taxes, until the heavy hand of the income tax thumps down. They amount to dollars to every individual. And, not only individuals, but communities, have come to realize that by the time this tax dollar leaves a community, makes its excursion to Washington then back, it suffers painful dilution—in fact, it is almost exhausted in sustaining all of those who handle it—and, if it returns at all, it is a rather small piece of change.

Many see this in the Hill-Burton Act health dollar or grant money, where the community provides two-thirds, to match one-third. Many justly feel that the original Hill-Burton dollar taxed out of the community was three-thirds dollar, or one whole dollar, and they see no further need of sending other of their community dollars upon such an exhausting vacation. They propose to use it at home in the community where it can buy a dollar's worth of health service under their own jurisdiction and control. They propose to spend it to obtain materials and services of professional personnel of their own choosing, not to be dictated to and propagandized by a bureau in Washington.

Certainly this means that the rural communities are becoming health conscious. And all these results emanate largely from, and through, the efforts of the general practitioner and his single-handed campaign in his community.

This view, in retrospect then, brings us to the question of: How fully is the medical profession utilizing its potential in stabilizing gains made in the health state of our nation? and, What are the needs for converting this potential to a kinetic force for future gains?

Today, the gravest threat against all that we hold good in time-proved methods of our government and its institutions, emanates from the bureaucrats within the bureaus of our government, who, in order to perpetuate themselves are sparking well-timed subtle propaganda, at government expense, which is revolutionary in character and designed principally as an entering

wedge for a totally centralized form of custodial government. It behooves us to recognize the power of these groups and their force. We have, for a number of years, seen steadily encroaching upon the private practice of medicine, our United States Public Health Service and its agencies. It has assumed even greater prerogatives outside its jurisdiction and may be rightly charged with dereliction of its main responsibilities. In other words, it has outgrown its pants and today is clamoring for a new suit woven from the fabric of the entire medical profession of this nation; and it proposes to dictate its style and structure—overnight there has been a metamorphosis in the personnel of this bureau from that status of physician—from the Surgeon General on down—to full blown experts of economic and social science. It is, indeed, regretful that this great institution which has had the staunchest support of American Medicine, and which functioned well then under able leadership, should be used as a tool to undermine a basic well-founded system of government.

As recently as last January, appearing in the *American Journal of Public Health and the Nation's Health*—Part 2 (January 1948 issue, paragraph 3, page 168), Surgeon General Parran states:

"Among representatives of all countries there is a general agreement that we are in a period of transition as regards the role of public health in modern society. Emphasis has shifted from the traditional concepts of giving alms to the sick, of environmental sanitation and of quarantine, to problems of providing adequate health facilities and services to all who need them. We are experiencing a progressive development of personal health service for the prevention of disease, such as venereal disease and tuberculosis, availability of medical care and medical aspects of Social Security. This broader scope of public health activity belongs to an age when dynamic new frontiers are opening and new concepts of social responsibility are emerging throughout the world." * * * "It may not be possible to accomplish all these objectives of a national health program in one single comprehensive act. The history of social legislation in our country has been an evolutionary process made up of one advance after another, each contributing to the final result, while the Public Health Service believes that the health of the nation can be met most effectively and in the shortest period of time through a broad program financed in part by

national health insurance, because of practical consideration involved we may need to accept a succession of limited enactments. The important thing is to start now, to be sure that each step is in the right direction and that none creates obstacles or vested interests which would impede further progress."

Now let us see what progress apparently has been made: The Congress in 1936 launched the Federal Aid Program with an initial appropriation of less than fifteen million dollars to the Children's Bureau and Public Health Service. This has gradually increased annually, and at the end of ten years, for the year 1947, one hundred and thirty-five million dollars were appropriated. Where the limits may be is up to us all to determine.

Now, what are we going to do about it? First, certainly, it is high time the medical profession adopted means and methods to make our status of health secure against all forces which might seek to undermine it. This will require greater effort from every doctor in America than he has ever given before. We have all, again, been somewhat lulled into a false sense of security at the inability of the proponents of dangerous national legislation to secure the entire favor of Congress in their aspirations. While the Wagner - Dingle - Murray bill seems to have been defeated, we may rest assured that the socializers are regrouping their forces for an approach a bit more subtle. None of these gentlemen has lost hope nor have they been greatly discouraged. Some of the principal actors and advocates have assumed slightly different roles, but the play goes on.

In support of this statement, I would call to your attention, again, the editorial on page 626 of the February 28, 1948 issue of the *Journal of the American Medical Association*, titled, "Is There a Shortage of Physicians?" Following this, we see in the March 6 issue of the same Journal, in the form of another editorial, titled "A National Health Assembly", in Washington, D. C., on May 1 through 4, 1948.* This, under the direction of Mr. Oscar Ewing,

*See report on this Assmby, New Orleans Medical and Surgical Journal, June 1948, p. 579.

new Field Security Administrator. He has announced the appointment of twenty-four national leaders, only one of whom is a physician, to discuss plans for—what? No doubt to launch another full-sized attempt at revitalizing a nationalized medical program in new dress, on the old Wagner-Murray-Dingle carcass—or at least to use this as a dust screen to cover attempts to secure such legislation piecemeal as suggested by Surgeon General Parran, recent spokesman for the United State Public Health Service.

No quarrel is proposed between the doctors or private practitioners of America and our Public Health Service of our nation, but it might be an appropriate time to redefine established and well-designed functions for this agency and its personnel and, perhaps, to assist in removing those from its service who would continue to pervert it from its former high plane of service.

No quarrel is proposed with our Social Security Administrator or his bureau and its present functions, but it might be well for us to register early our inability to aid and abet him or his bureau in attempts to destroy the great heritage of America—free enterprise and the right to choose our way of living.

Since Mr. Ewing proclaims his call for a national health assembly is for the purpose of determining health facilities and personnel of the nation and of each community, and to determine the health deficit, it would seem strange that he should choose only twenty-four people—mainly from New York and the East. It seems equally strange that he should ignore information assembled in the files of the American Medical Association, supplied by very accurate surveys made by State medical societies. It is equally strange that since Mr. Ewing proposes to determine health needs and facilities in local communities and states, that representatives from the various states with sound knowledge of these needs should not have been invited to participate. Since this is a national meeting it might be well if every state medical society would offer Mr. Ewing a represent-

ative of their doctors to aid in these deliberations at this Assembly. Certainly, if a ten-year national health program is to be set up in conformity with conclusions reached at this Assembly, it would appear that a far greater representation of informed people should be permitted to participate in formulating these conclusions.

The second, and equally as important task before us, is to open up those new frontiers for better health—those long neglected and forgotten by the United State Public Health Service—and perhaps by us all. This is the field of Public Health Education, including all that the term implies.

In a recent survey of the educational institutions of Colorado and some of our neighboring states, by our Committee on Public Health Education, it was found that there was not one college offering really good courses in health education. If we turn out from our colleges, teachers who are to teach the children of our states and nation—teachers without a good knowledge of good health practices, they are not really educated, nor can they be expected to properly educate our children. At present, the teaching of health is promoted by lay groups. While actually this is a responsibility of the medical profession, and we must assume it, I am advised by such authorities as Dr. Smiley of the American Medical Association that a like situation obtains in all of our states. He knows of no state where proper emphasis has been given by colleges preparing teachers in matters of health teaching.

The public schools, from the grass roots on up, are charged with the responsibility of children and their guidance for longer periods than any other agency. It is here where they are confined in a community form of effort, and, consequently, it is here where the health status of our future citizens can best be molded. It is here where personal hygiene, mental hygiene, and sanitary community practices can best be improved and proper health attitudes engendered, which will be carried into the homes of these children—and last, but not least, complete a neglected field in education, a

deficiency that today is our major impediment to better health, and which fosters quackery in all its forms. It leaves a fertile field for demagogues, and a dangerous one for our youth. Certainly, fundamental knowledge in sound health practices is every bit as essential as the three R's in education—Reading, Riting and Rithmatic.

We are aware that our metropolitan areas are more fortunate in obtaining qualified health teachers, just as they are more fortunate in obtaining doctors, dentists, and nurses—because of concentrated population, appropriation of funds to meet such needs are possible. It is the rural areas, where the fourth R may well be added to education—Rural Health—and, it is a responsibility of the medical profession, down to each individual doctor.

It is the direct responsibility of the medical profession to provide leadership in a campaign to see that every instiution of higher learning provides required courses to their students in this much neglected field of education, and strong emphasis should be on a minimum of requirement for certification for all teachers, and that provisions be made for those teachers not so qualified, to receive essential courses while in service and during summer sessions.

As has already been mentioned, there is a rural community consciousness in health matters. Today, as in the past, the public looks upon the doctor for guidance in all matters pertaining to health, and the responsibility of the doctor is to meet this challenge. Not only must he keep qualified to render the best in medical care, he must keep qualified to advise the best in public health measures for his community.

With trends of the past few years, we see dangers in the offing: One is a community physician, or general practitioner, inadequately trained in public health matters and preventive measures, or one who has become negligent in this phase of his obligation as a physician, or he may have become negligent in these matters because other agencies in his region have, in a fashion, assumed these prerogatives. The

other, perhaps the greater danger, is a Public Health physician, superbly trained in preventive medicine but with woefully inadequate training in curative measures, who might be compelled, or assigned by economic forces or by poorly-informed public opinion, to minister to the sick of a community. So, if a general practitioner is to meet his community needs, he must serve in a dual capacity of doctor and teacher.

As a teacher, he must do more than play the role of private tutor to his patient and the family—he should use, for the dissemination of health information, the service clubs and Chambers of Commerce, the various women's clubs, demonstration clubs, 4-H clubs, Parent-Teacher-Associations, and, most important, the schools. He should, when requested, serve as a member of the School Board—most communities greatly appreciate his service in this matter. The occasional excuse that one is just too busy is entirely untenable, because businessmen are also busy, but they do take time out to render such service.

It should not prove too difficult, in any county or district medical society, to arrange a series of meetings with these various groups, at which some phase of health is discussed, such as: immunity to disease—nutrition and health—milk, and its role in propagating disease—specific diseases such as tularemia, undulant fever, or brucellosis, trichinosis, typhoid fever and its transmission, amebic dysentery and its propagation—and a host of other subjects, all of public interest.

As a civic duty, every general practitioner in a rural area owes it to his community to take an active interest in providing the essentials of basic education for the children of his region. As a physician, his obligation extends beyond that. He has long been looked upon as the community's guardian of health. And, he may be rightfully charged with the duty of advisor in the basic health education program of the school.

It is most difficult to conceive the reason for educational neglect in this important phase of our preparation for future

citizenship. Whatever the cause or reason, a big step toward closing the gap can be provided by the doctors in each area. Certainly, it should not be too difficult for the local doctor or doctors to arrange a program of health teaching in the school with school boards and teachers and with existing parent-teacher organizations. I have found teachers' interest in health matters to be high, even though in most instances their information on the subject is meager.

But the rudiments of health teaching should be provided the teacher by the county medical society or by the local doctor until such time as adequate courses in the subject can be procured in our universities and teachers' colleges.

After all, it is most essential to concentrate our efforts along avenues that will meet our state's most urgent need in the shortest possible time.

Instilling proper health attitudes in our youth today, and continuing with an adequate program for ten years, would assure greater health benefits to our states and to our nation than would forty years of equal effort with adults alone.

It will require some years of effort to develop ideal state programs, but an adequate beginning is not beyond our ability today. The question is: Are we general practitioners willing to assume the role to which we pledged ourselves when we choose our profession?

URINARY TRACT INFECTIONS DURING PREGNANCY*

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NEW ORLEANS

Urinary tract infections are very common in the female. The incidence is greater during pregnancy; consequently, much can

be learned about the subject by studying gravid individuals.

INCIDENCE

There is a marked variation in the occurrence of bacteriuria as reported by various investigators. The consensus of opinion is that urinary tract infection is more common in cyesis. The incidences given vary from 6 per cent to 40 per cent. Cystitis is common, although in many it is asymptomatic. Pyelonephritis, more commonly called "pyelitis of pregnancy," occurs in about 2 per cent of all pregnant persons. Bilateral involvement has been stated to occur in the great majority—about 76 per cent. Cortical abscesses are unusual. Likewise, bacteremia is seldom found. Realization of the frequency of these infections leads to proper appreciation of their clinical importance.

PATHOLOGY

The study of urinary infections must of necessity include the investigation of stasis. For stasis to exist there must be physiologic or physical obstruction to the outflow of urine. Appreciating the combination of stasis and infection of the urinary tract, the increased frequency of urologic infection during pregnancy is easily understood. Hydro-ureter and hydronephrosis are physiologic during pregnancy. Whether the condition is due to endocrine changes, pelvic mass, rotation of the uterus, or to the relation of blood vessels during pregnancy, is actually of little clinical importance in considering the therapy to be administered. Should this physiologic stasis be associated with infection, the amount of stasis tends to increase. Persistent inflammation leads to fibrosis with stricture and kink formation of the ureters. When involvement of the parenchyma of the kidney persists over a long period of time in the form of chronic pyelonephritis, it has been shown by Crabtree and others that hypertension may result.

Infection can reach the kidney by ascending along the urethra, bladder, ureters, and pelvis. It may ascend along the lymphatics or spread from the bowel to the kidney by way of the lymphatics. The third method is by blood stream invasion. The majority

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of infections are ascending in type and most commonly Gram negative bacilli are involved. Should the infection due to bacilli be severe abscess formation may take place in the medullary portion of the kidney. Hematogenous spread is apt to lead to cortical involvement. Should abscesses develop there, they are more often due to the Gram positive cocci.

DIAGNOSIS

A history of previous urinary tract involvement is frequently elicited. The patients with childhood infections and urinary infection during previous pregnancies should be particularly investigated. The symptomatology of urinary tract disease during pregnancy is interesting in that many have low grade infections without symptoms and occasionally a very ill patient fails to have localizing symptoms. Frequency of urination commonly accompanies pregnancy and is not considered an abnormality, but when accompanied by dysuria or strangury, inflammatory process is suspected. Dysuria occurs in 23 per cent of all urinary tract infections. Fever occurs in 38 per cent, chills in 28. Approximately 10 per cent of the patients have gastrointestinal symptoms. Pain is perhaps the most frequent symptom. Clinical manifestations of the disease make their appearance most commonly during the second and third trimester, but in some instances they wait until after delivery. As a cause of postpartum fever urinary involvement tends to make its appearance early. Many of these patients appear surprisingly well in spite of their high fever, while some of them are obviously ill. This is perhaps best correlated with the extent of involvement of the kidney parenchyma. Observations of the temperature and pulse of the patient seem to be the best means of ascertaining the course.

Examination leads to the elicitation of tenderness in the renal and ureteral regions of some patients. Early in the attack this tenderness may be absent. Due to the presence of the pregnant uterus, and at times to the accompanying abdominal distention, palpation of the kidneys is often difficult.

The most important procedure in diagnosis is proper urinalysis. It is necessary to catheterize the patient so that the urine will not be contaminated with material from the vagina and vulva. The specific gravity, reaction, amount of sugar, albumin, and acetone should be determined. Microscopic examination of the wet and Gram stained sediment must be done. Commonly in the moderately and very severe infections a small amount of albumin is found. In instances of vomiting and dehydration acetone may be identified. The extent of pyuria is quite variable and tends to agree with the severity of the infection, but we must remember that at times ureteral obstruction may interfere with the drainage of pus from the upper tract. Erythrocytes are encountered frequently. Gram stained smears, though not as accurate as cultural determination for bacteria, are of great value in that they require a shorter period of time and aid in determining the type of therapy. Urine cultures are the most reliable method for determining the presence of bacteria and should be obtained, using aerobic and anaerobic methods.

Test of kidney function is essential in determining the extent of infection and the method of management. In instances of failure of response to therapy, faulty kidney function should be suspected. Fishberg concentration and P.S.P. tests are easily performed. Urea clearance is a more reliable functional test.

For accurate diagnosis cystoscopic manipulations are essential. They allow the visualization of the bladder to determine the extent of involvement, and the passage of catheters via the ureters to the renal pelves, whereby we can obtain urine from each side to learn whether the infection is bilateral. Also this material can be studied and cultured. The degree of stasis is of importance and can be ascertained by aspiration. Ordinarily, in pregnancy the renal pelvic capacity increases from 7 cc. of the nonpregnant to 15 to 30 cc. While the catheters are in place indigo carmine may be injected intravenously to determine rapidly the function of each kidney. After these

tests, catheters may be left in place as a means of maintaining drainage.

Radiography as well is essential to complete diagnosis. Plain K.U.B. films may reveal the configuration of the kidneys and the presence of urinary calculi. Urography to outline the calices, pelves, and ureters may be obtained by excretory methods in instances of good renal function. If the function is poor, radiopaque media should be injected through indwelling catheters. The changes in the position of the kidneys and ureters from the supine to the erect position should be determined by the proper films.

While investigating the urinary tract one must not overlook a complete evaluation of the patient, which necessitates a complete history and certainly a thorough physical examination. Proper laboratory investigation is in order in such diseases as diabetes and anemia.

ROUTINE INVESTIGATION

Since the frequency of involvement is about one in every fifty pregnancies, we believe it justifiable to catheterize the patient routinely and to analyze the urine properly on the initial visit. By so doing many sub-clinical infections will be diagnosed. If bacteria or leukocytes are present the patient should be treated. Findings of any abnormality, even in the absence of a history of urinary symptoms, indicate the necessity for the determination of renal function by P.S.P. and Fishberg tests.

When there is a history of urinary tract disease it is then imperative that catheterized urine be obtained, properly examined, and that the function tests be carried out. It is preferred that x-ray studies be made with excretion urography if function is satisfactory; and if not satisfactory, then with retrograde injection of the media. In many instances cystoscopy with its added diagnostic procedures should be used.

AMBULATORY THERAPY

The majority of patients under consideration do not require hospitalization and can be treated on an ambulatory status. The urinary antiseptic of choice, in the majority of instances, is sulfadiazine. The dose is from 0.5 to 1 gram after meals and at bed-

time. Fluids should be forced and the urine should be alkalized with sodium bicarbonate, citrate, or lactate. If edema is present the potassium salt is indicated. A nutritious diet is essential. Proper evacuation of the bowels must be promoted. Rest periods throughout the day are encouraged. The patient should abstain from intercourse and avoid condiments, alcohol, and fatigue. Foci of infection should be properly managed, remembering the importance of cervical and vaginal varieties. Should bacteria or pus persist, cystoscopic investigation is essential even though symptoms have not occurred. By this procedure one may be able to ascertain the cause, and correct it long before the patient experiences disagreeable manifestations. When therapy must be continued over a long period of time it is desirable to change the chemotherapeutics. Methenamine and mandelic acid are effective for some bacteria in the properly acidified urine. Since acidification is essential to their effectiveness the fallacy of continuing administration in the presence of an alkaline urine is easily appreciated.

THERAPY OF THE ACUTE ATTACK

With severe infection one orders bed rest, fever measures, analgesics (usually morphine, dilaudid, or demerol) and a high fluid intake. If nausea and vomiting prohibit the latter, the patient should be given dextrose and vitamins by vein. In some instances because of the loss of chloride by vomiting, saline administration will be indicated, but in the majority, 5 or 10 per cent dextrose in water is the proper solution. Decision regarding blood transfusion will depend upon the degree of anemia and the severity of the infection. Most of the patients with severe urinary tract infection during pregnancy should be given blood. Many not only have anemia but also have hypoproteinemia. If distention is present it may be combatted with a small rectal tube and in some injections of prostigmine. At times Wangensteen suction is necessary. In the patient free of nausea and vomiting saline laxatives or cathartics are frequently advisable. A bland, high vitamin, high

protein diet, with vitamin supplements is commonly used.

Sulfadiazine is the agent of choice in the majority of cases. One gram is administered every four hours with an adequate alkalinizing dose of a sodium or potassium compound. At least 6 grams of alkali throughout every twenty-four hours is required to produce the proper pH. A blood level of 8 to 12 mg. per cent is considered essential in severe infections. Penicillin is administered with an initial dose of 100,000 units and 50,000 units, intramuscularly, every three hours thereafter until the patient becomes afebrile for at least forty-eight hours. In managing the severely ill individual we do not feel that it is justifiable to wait on the report concerning cultural growths before instituting therapy. Therefore, sulfadiazine and penicillin are employed in combination. Unless prompt response occurs the patient is considered a candidate for cystoscopy and indwelling ureteral catheters. The degree of obstruction, the amount of stasis, plus the severity of infection, govern the time that the catheters should be allowed to remain *in situ*. It is essential that these catheters be kept open by hourly irrigation with saline. An indwelling urethral catheter allows accurate recording of the output of urine and aids in maintaining the ureteral catheters in position. It is essential that the catheters drain properly from the renal pelvis or they add insult to injury by acting as a foreign body.

In severe infections due to *Escherichia coli*, *Proteus vulgaris*, *Aerobacter aerogenes*, *Pseudomonas aeruginosa* (*B. Pyocyaneus*), *Hemophilus influenzae*, and *Mycobacterium tuberculosis*, streptomycin is the antibiotic of choice. The dosage should be 125 to 375 mg., intramuscularly, every three hours giving a total of 1 to 3 grams daily for five to seven days. With the exception of tuberculosis there should be a response within forty-eight to seventy-two hours. Ordinarily the therapy need not be continued longer than five to seven days. It is essential that adequate doses of streptomycin be administered as organisms

rapidly develop a high degree of resistance to this antibiotic. Alkalinization of the urine is advisable in streptomycin therapy. The untoward reactions which are most likely to occur with streptomycin are pain at the site of injection, fever, anorexia, malaise, headache, arthralgia, nausea, and vomiting. Because of the short treatment period labyrinthine disturbances are seldom encountered.

In contrast to the period before adequate antibacterial agents were available, patients rarely require termination of pregnancy now for control of urinary tract disease. In Charity Hospital at New Orleans 15,000 deliveries have occurred since the last instance of termination of pregnancy for such a reason. In the presence of certain associated severe diseases, however, interruption of pregnancy is necessary to abort the progression of the disease. This is particularly true of toxemia of pregnancy and sickle cell anemia in the Negro. In the rare instances of persistent unilateral cortical abscesses or carbuncle of the kidney it may be necessary to perform nephrectomy as a life-saving measure. Rarely, a stone within the ureter will cause continued obstruction so that its removal is essential to cure or to prevent permanent damage.

PROGNOSIS

In general, with the therapeutic armamentarium that we now have, prognosis is excellent, but this should not lead us to complacency in the management of these cases. The mother has an excellent outlook for carrying her pregnancy to term. In future pregnancies a recurrence is likely. In fact some investigators have shown the rate to be 50 per cent. Depending upon the extent of the process, the outlook as to residual effects is variable. Certainly, patients should be followed until all evidence of urinary tract infection has ceased. By continuing proper therapy, chronic pyelonephritis may be arrested, and in some instances we believe that the development of hypertension will be prevented.

The outlook for the infant is ordinarily good. It has been our observation that the shorter the duration of gestation, the more likely the occurrence of abortion with se-

vere infection. Cystoscopic manipulations are not associated with abortion except in the rare instance in which the patient already is threatening to abort. The necessity for its performance is such as to exceed the danger of terminating the pregnancy. We have not noticed congenital malformation of the offspring of patients with severe pyelonephritis.

In order to determine the extent of damage to the kidney from pyelonephritis it is essential that one wait several months after the termination of pregnancy because the degree of recovery may be remarkable.

ABSTRACT OF TWO CASES OF SEVERE INFECTIONS

Case No. 1. D. M., negro, aged 19 years, Gravida III, Para II. Admitted July 21, 1946. Right nephrectomy August 1, 1946. Discharged August 15, 1946. No known previous pyuria or kidney disease. Had costovertebral pain without chills or known fever with last pregnancy. Previous section for total placenta praevia. Complaints: Dull aching pain, four days. Chill twelve hours. No dysuria or urgency present. No G. I. symptoms.

Physical examination: Right costovertebral angle tenderness. Moderate tenderness in right flank and lower abdomen. Acutely ill. Temperature 103.4° F. Pulse 110. Respiration 30. Uterus 4½ months size. Fetal heart tones heard.

Cystoscopic examination: Stasis, right, 30 cc. Left, 15cc. Pyuria on right. Indigo carmine excretion: Fair on right. Excellent on left.

Laboratory findings: *Aerobacter* on culture. Gram negative bacilli on smear. Two plus albumin. W.B.C. 50-75. R.B.C. Few per high power field. (Pyuria persisted until postoperative period). Urea Nitrogen varied from 10.3 mg. to 12.5 mg. per cent.

Retrograde pyelogram: Marked right hydronephrosis with kink at ureteropelvic junction. Dilation on upper third of ureter.

Antibacterials: Penicillin 1,410,000 units. Sulfadiazine 22 Gm. Sulfacetamide 34 Gm.

Excellent output of urine throughout hospitalization. Evidence of infection did not recur after discharge from hospital.

She was readmitted and delivered of a normal infant on November 5, 1946 by repeat elective section with tubal ligation. Subsequent course was excellent.

Case No. 2. V. M., negro, aged 19 yrs., Gravida I. Admitted January 16, 1947. Discharged March 13, 1947.

Past history: No urinary disease.

Complaints: Dysuria with tenesmus seven days. Chills three days. Pain in right flank.

Physical examination: Acutely ill. Temperature 103.4° F. Pulse 115. Respiration 26. Marked right



Figure 1: Retrograde pyelogram of case 1.

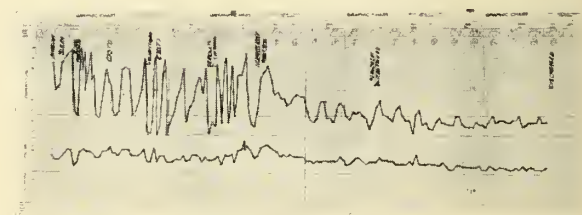


Fig. 2: Graphic chart with notations of case 1.

costovertebral tenderness. Right flank tenderness. Uterus of 3½ months pregnancy size.

Laboratory findings: Urine—Sp. Gr. 1.012, alkaline, trace of albumin. Leukocytes 100 per high power field. Gram negative bacilli. Gram positive cocci. Cultures: *Aerobacter* and *Proteus*. P.S.P.: Total in two hours 60 per cent. Fishberg: 1.005 to 1.012. Urea Nitrogen 10.4 mg. per cent.

Cystoscopic examination: Stasis—75 cc. on right. 25 cc. on left. Bilateral infection. P.S.P.: 10 per cent on right (two hours) and 45 per cent on left.

Antibacterials: Streptomycin 21 Gm.; penicillin 1,535,000 units; sulfadiazine 144 Gm.; sulfathalidine 24 Gm. After therapy—P.S.P. excretion in two hours was 25 per cent on right and 60 per cent on left.

Delivered June 23, 1947 by low forceps.

CONCLUSION

1. The frequency of urinary tract in-

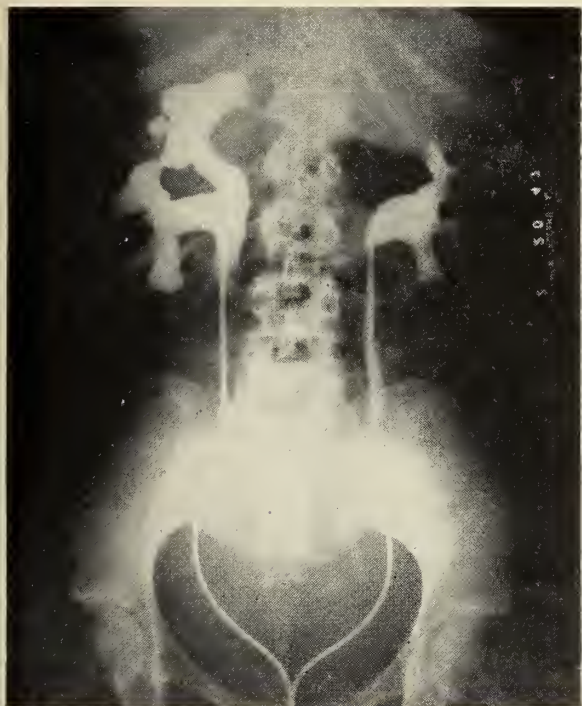


Figure 3: Retrograde pyelograms of case 2.

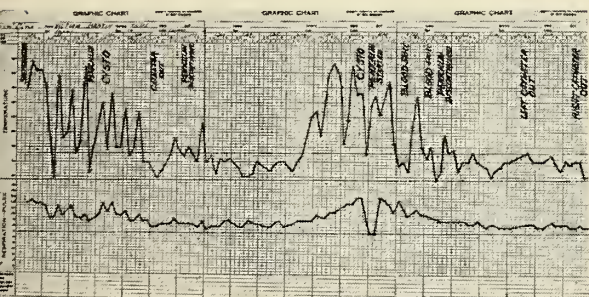


Figure 4: Graphic chart with notations of case 2.

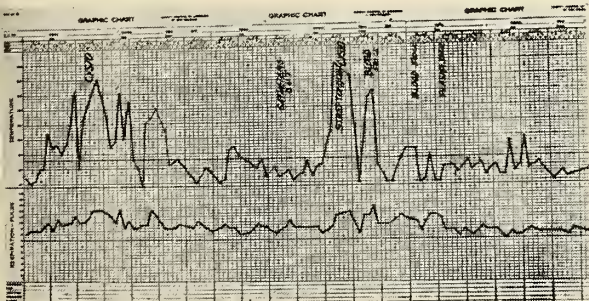


Figure 5: Graphic chart continued of case 2.

fection during pregnancy necessitates routine investigation.

2. Previous infection or presence of anomalies renders the pregnant patient more susceptible to urologic infection.

3. Active therapy in cases of asymptomatic or mildly symptomatic involvement will prevent severe developments.

4. Cystoscopic examination should be employed in failure of response.

5. Prognosis is excellent for the mother and offspring with proper therapy.

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DISCUSSION

Dr. Charles O. Frederick (Lake Charles): Dr. Beacham has so thoroughly and adequately covered this subject that he has not left anything for me to add. I would like to make a few comments, and possibly, emphasize some points brought out in this excellent discussion of renal obstruction in pregnancy.

In our section of the country, pyelitis of pregnancy is seemingly less frequent in the last few years than formerly. It is probable that obstetricians and others are using the antibiotics and sulfa drugs and that is why we see less pyelitis. I agree with Dr. Beacham that in ambulatory cases sulfadiazine is the drug of choice in the dose as indicated. In my experience it has been very satisfactory. However, in seriously ill individuals, with a Gram stain showing a Gram negative bacilli infection, I prefer to use streptomycin and penicillin immediately. I fear that in seriously ill patients with vomiting and high fever there is an increased risk of crystallization when sulfadiazine is administered.

I thoroughly agree that it is unwise to wait for the report of the culture before starting treatment of patients who are acutely ill. The benefit of therapy should not be delayed while waiting for a report.

I lean toward intravenous urography rather than retrograde studies as far as possible. I would rather sacrifice accuracy of decision in upper urinary tract infections in pregnancy than to do retrograde studies. If the patient does not improve, and there are other signs of toxicity, then retrograde studies should be considered. I prefer to use intravenous urography as much as possible, and in most cases this gives all the information needed in studying these cases. It is noteworthy, as Dr. Beacham said, how rarely one has to do any manipulative surgery where stones are involved. It is surprising how large a stone will pass when there is pregnancy.

The other thing I would like to bring to your attention is an article in the *Journal of Urology** of January 1948 on the use of sulfathalidine in colon bacillus infections of the urinary tract. The conclusions are strictly limited to colon bacillus infections. It shows good results and bacteriologic cures in treatment with sulfathalidine. The report shows that Everett used sulfathalidine for six to nine months with practically no toxic effects. In cases of pregnancy my impression is that there is clinical improvement but not bacteriologic cure. In treating a patient that is six months pregnant and still three months to go, not many like to use sulfadiazine for three months even in small doses. If the individual has a colon bacillus infection and you give sulfathalidine, it is effective and much less toxic. We may have something here which you can give the patient for three months without the toxic effect of other drugs. I have not used it, but it seems to me that it might be of advantage in cases of colon bacilli not mixed infection.

It should be mentioned additionally that in all cases we should strive for a bacteriologic cure after delivery. Some patients will have to be re-pyelographed from a functional standpoint to determine whether any disease process or obstruction or stones exist. These are not as easy to pick up during pregnancy as afterwards. Some has to have open surgery. The main thing is to follow long enough. When the patient feels like going home and does not have many symptoms, so many doctors just drop the subject of urinary infection. You have to persist in your efforts, otherwise the patient will carry a chronic infection for years.

I enjoyed this paper very much and think it is one of the best at our State Society meeting.

Dr. J. R. Stamper (Shreveport): I would dislike very much to disagree with such a scientific and detailed discussion as this one presented by Dr. Beacham. However, the discussion might be slightly misleading from the standpoint of the kidneys producing abscesses from back pressure

due to pregnancy. There is no difference in cortical abscess from back pressure of pregnancy and back pressure from blockage due to stones and other things. Many years ago we felt that when a kidney developed cortical abscesses it was necessary to remove it. Now we operate upon kidneys with cortical abscesses, and if the obstruction is removed the cortical abscesses will get well with the aid of the antibiotics and sulfonamides. Therefore, it occurs to me that in a situation where pregnancy exists and the development of cortical abscesses is threatened, it would be better to consider interrupting the pregnancy and saving the kidney. Of course, one still has the question of which the patient wants most,—the child or the loss of the kidney. If she is willing to sacrifice the pregnancy, it is certainly possible to save the kidney.

Dr. H. T. Beacham (In conclusion):

We do not wait for reports of the cultures before instituting treatment. As I stated, we Gram stain the urinary sediment and study it so that we will know the type of organisms with which we are dealing. The cultures are used to confirm our impression as to the type or types of bacteria involved.

In regard to the question of removal of the kidney, I am sure that the incidence of abortions following nephrectomy is no higher than that resultant from other major surgery. The decision as to the removal of the kidney or surgical drainage thereof should be individualized in every case. If multiple abscess or carbuncle of the kidney fail to respond to the administration of penicillin and sulfa drugs, nephrectomy would be indicated in certain cases. If there is localized suppuration one of course would consider the advisability of incision and drainage.

THE BASIC TREATMENT OF RHEUMATOID ARTHRITIS

THOMAS E. WEISS, M. D.

NEW ORLEANS

The treatment of rheumatoid arthritis must be undertaken with the realization that it is a chronic, systemic, inflammatory disease of unknown etiology, for which specific therapy is still lacking. To date, treatment is dependent on nonspecific secondary measures, which are directed towards relief of discomfort, and prevention and correction of deformities. In view of this, it is recommended that a basic pro-

*Everett, Houston S., Vosberg, Gilbert A., and Davis, James M.: The treatment of *E. coli* urinary infections with sulfathalidine (phthalylsulfathiazole). *J. Urol.*, 59:83, 1948.

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gram of treatment be instituted in all cases of active rheumatoid arthritis, even if it is planned to employ some new drug or the one in favor at the moment. The importance of early institution of such a program is shown by the report of Short and Bauer¹, who obtained remissions in 37 per cent and improvement in 73.9 per cent of their patients treated in this way during the first twelve months of their illness. The patient should thoroughly understand that the therapy will be lengthy and may greatly alter his mode of living.

A basic program should include: (1) a thorough understanding of the disease by the patient, (2) rest, (3) exercises, (4) plaster splinting, (5) analgesics, (6) other physical therapeutic measures besides exercises, (7) dietary management, (8) treatment of anemia, (9) psychotherapy, (10) orthopedic appliances other than splinting, and (11) orthopedic corrections. For the sake of completeness the adjuncts to this basic treatment will also be discussed. This discussion is directed chiefly toward treating active rheumatoid arthritis before the occurrence of ankylosis.

THOROUGH UNDERSTANDING OF THE DISEASE BY THE PATIENT

The patient's ability to comprehend his condition should be evaluated. With this as a guide, the patient should be informed of the chronicity of the disease, the lack of specific cure, the frequency of exacerbations, and the aims of therapy. An early understanding of the problem gives the physician and the patient the same perspective, so that the former is not too frequently confronted with "baited questions" which may lead to erroneous answers, and consequently, false hope for the patient. Once the patient has accepted his condition, and the slow moving methods of therapy, he is in a better state of mind to carry out the recommendations. Patients must often be gently reminded of this problem. Such an understanding will also prevent much of the patient's anxiety and a constant, costly, and at times harmful search for a "cure."

REST

Although it is generally recognized that rest is of value in treating rheumatoid arth-

ritis, Pemberton² has estimated that only about 11 per cent of patients are properly instructed as to the value of rest. Since the disease is a systemic one, the ideal would be absolute bed rest for all patients with active rheumatoid arthritis. As this is often not feasible, it is probably safe to compromise in the mild cases in which there is no involvement of any weight-bearing joints, and in which there is absence of systemic symptoms, such as fatigue or fever. Such patients should obtain one hour of bed rest each morning and afternoon, twelve to fourteen hours each night and a full day each weekend. If after six to eight weeks of this routine there is no improvement, absolute bed rest should then be recommended. Absolute bed rest is also indicated in cases in which there is a systemic reaction, the process tends to be progressing rapidly, one or more weight-bearing joints are involved, or there is atrophy of a posture controlling muscle group. Absolute bed rest does not imply absolute negation of physical activity, as subsequent measures will illustrate. If absolute bed rest is indicated, hospitalization is helpful, for in the hospital it is easier to educate the patients and be certain that they are following instructions. The duration of bed rest depends upon the patient's response; thus, it is impossible to determine beforehand the amount required. It should be continued at least two weeks after all systemic or articular activity has subsided, when activity may be gradually resumed. If a flare-up in the rheumatoid arthritis follows the increased activity, the patient should resume complete bed rest. Articular effusions may tend to persist long after all others signs of activity have disappeared. This alone is not a contraindication to continued physical activity.

EXERCISES

Because of pain caused by motion some patients with rheumatoid arthritis assume the most comfortable position and seldom move. Consequently, fixation of joints in these positions results in pronounced loss of flexibility of the joints.

With stress placed on resting it may be confusing to underscore the importance of exercises. Exercises are designed to retain

and increase all possible articular motion, and to prevent deformities and muscular atrophy. In the absence of weight-bearing these movements apply little pressure to inflamed articular surfaces and tend to prevent fibrous bands from forming in the joint, so that fixation or ankylosis is prevented.

Should the patient be considerably debilitated or have a temperature of more than 100° F., exercises may be postponed until a more favorable period. However, if these patients show signs of loss of articular motion, exercises should be seriously considered. These should include both passive and active movements. For swollen or painful joints, it is advantageous to move the joint gently through as complete a range of motion as is possible, once or twice daily. Pain at the time of motion is not a contraindication to exercise. If fatigue or pain increases following exercise, the activity should be diminished. Joints should be actively moved by the patient through their full range of motion whenever possible.

It is best to outline a set of written exercises, whereby each joint, be it involved or not, is put through its complete range of motion one to ten times daily. The exercises are to be gradually increased in number, and should fatigue ensue or increase in pain occur, the number of repetitions must be reduced, and then built up slowly. These exercises can be found in any of several textbooks on arthritis.^{3, 4} Patients should be warned not to pull, twist, wiggle, or rub inflamed joints. An ambulatory patient, or one who is active, will probably not require such exercises. Examination, however, may reveal increasing limitation of motion due to overguarding of a painful joint. Such a situation can, to varying degrees, be alleviated by exercises.

The services of a trained physical therapist can be most helpful in carrying out this phase of treatment, and early in treatment it is wise to have the patient do the exercises under trained supervision. Underwater exercises are often helpful in early stages, and such facilities, when available, can be used to advantage.

PLASTER SPLINTING

The proper use of plaster splinting is of great value for treating joints affected by acute rheumatoid arthritis. Plaster supports not only aid in resting the involved joint but will also prevent and help correct deformities. Occasionally, plaster supports will alleviate severe articular discomfort which ordinarily would require large doses of analgesics. Herein lies an early need for consulting an orthopedic surgeon.

Plaster supports are most suitable for the extremities and should be restricted to one of the many types of bivalved casts. Often a posterior splint will prove adequate. Such a cast permits immediate application of heat to the joint and use of exercises for the joints. Acute rheumatoid joints should not be encased in a complete plaster splint and allowed to remain there unexercised.

Casts for the lower extremities should furnish complete support for the entire foot and extend to a point several inches below the gluteal fold. A firm flat mattress offers adequate splinting for the hips. Lateral rotation of the hip can be prevented by incorporating a short cross bar back of the heel of the cast. When such is possible, the cast for the lower extremities is to be made for legs in full extension. If there is a flexion deformity, the cast outline should be made so that the leg will be extended as far as possible and still be comfortable. The use of heat and exercises will possibly result in a decrease in the flexion and the cast must then be straightened. Straightening the cast will sometimes tend to correct the deformity. The incorporation of side-irons⁵ in such a cast is helpful.

Plaster supports for the upper extremities should be designed to maintain the fingers, wrist and elbow in the most useful position, for ankylosis of these joints in a poor position may make them useless.

Splints should be worn at least an hour every morning and afternoon, and if possible the patient should learn to sleep in the casts or wear them as long as possible at night. It must be remembered that casts should be comfortable, and easily removed and applied so as to facilitate the local ap-

plication of heat and the performance of exercises.

ANALGESICS

The pain of rheumatoid arthritis can be controlled in most cases by acetylsalicylic acid (aspirin) or a salicylate preparation. Besides being valuable analgesics, there is evidence^{6, 7} suggesting that these may even retard the progress of the rheumatoid process. Acetylsalicylic acid is believed to be more effective than sodium salicylate, but because the former often causes gastric distress, the latter may be more suitable. Dosage is dependent on the patient's response and the prevention of toxic manifestations. The average patient can usually tolerate 40 to 50 gr. a day without gastric distress or toxic manifestations. Sometimes it may be necessary to increase this to as high as 15 to 20 gr. every three to four hours. The use of increased doses in the morning and evening often counteracts the unpleasant symptoms characteristic of these periods.

Should gastric symptoms result from acetylsalicylic acid, small doses of bicarbonate of soda may alleviate the distress. A small dose of aluminum hydroxide may be substituted for the soda if there seems to be a lessening of the analgesic effect of the acetylsalicylic acid. Enteric coated acetylsalicylic acid has also proved of value in such cases.

If acetylsalicylic acid or the salicylates cannot be used or do not afford symptomatic relief, acetophenetidin (phenacetin) can be given alone or in conjunction with these drugs. If the pain persists despite the use of these drugs, $\frac{1}{4}$ to $\frac{1}{2}$ gr. of codeine can be added to the patient's medication. As night time is often unpleasant because of pain and insomnia, the patient will be grateful for the use of a sedative and analgesic combination. The administration of opiates should be avoided, and if discomfort is so severe as to warrant their use, it is highly probable that the cause of pain is not solely a rheumatoid process.

PHYSICAL THERAPY

Physical medicine plays a large and important role in the basic treatment of rheu-

matoid arthritis, and it usually implies the use of heat and massage. Exercises, an important part of the physical therapy program, have already been discussed.

The application of heat, be it moist, dry or radiant, to a painful joint usually relieves the discomfort temporarily, and in the presence of limitation of motion often permits greater mobility. Hot packs, which should be allowed to remain on for twenty or thirty minutes, require the attention of trained attendants, and often when multiple joints are involved, the patient may find these uncomfortable. Often hot immersion baths of the involved part can be easily carried out and these are equally beneficial. Infra-red lamps afford a ready source of heat, and can be used safely for a period of twenty to thirty minutes.

For patients who are not debilitated, hot tub baths often afford considerable relief and provide a good method for treating involvement of multiple joints. Tub baths of 100°-104° F. should not last longer than twenty to twenty-five minutes, and when first instituted they may cause the patient to become weak or unduly fatigued. An attendant should assist with hot baths.

Hot paraffin baths can be used for painful hands or feet, and although there is no evidence to prove that this type of body heating is more beneficial, some patients obtain longer relief. These baths can be taken at home at relatively little expense.

Occasionally the application of heat to an acutely inflamed joint may increase the pain. In such cases, cold applications can be tried temporarily. Should this also prove aggravating, temporary immobilization and analgesics usually are adequate.

There must be guarded use of massage. The physical therapist should have a gentle hand and confine the massage to the muscle groups, avoiding the involved joints. Painful, tender or swollen joints must not be traumatized by massage. Muscle bulk can be saved or restored only with proper exercise.

DIET

There is no evidence that diet *per se* has any direct effect on rheumatoid arthritis.

To neglect dietary instruction, however, may cause the patients to continue faulty eating habits which they have acquired because of fads or false therapeutic hopes. The dietary suggestions should be directed toward restoration of nutrition, maintenance of this state should it be present, or possibly reduction in weight should it be considered that faulty joints will be burdened with unnecessary weight.

A high caloric, high vitamin diet, based on foods rich in carbohydrates and protein, should be recommended for those patients of normal or below normal weight. An attempt should be made to reduce the obese patient, but if the disease is active or a patient is in the early period of convalescence, rapid reduction is not advisable. The systemic nature of the disease will cause some loss in weight, and if dietary restriction is great, it may result in debilitation and thus confuse the clinical picture.

The recommendation to maintain a high vitamin diet should be accepted with reservation and the continued use of costly high vitamin mixtures is not necessary. Cod liver oil (dosage 60-90 cc. daily) serves several beneficial purposes. It contains vitamins A and D, and is an excellent agent to aid the patient in gaining weight. Should cod liver oil prove disagreeable, vitamin A and D concentrates can be used.

A low vitamin C level is sometimes found in patients with rheumatoid arthritis, but this is not a deficiency peculiar to this disease. However, an adequate intake of vitamin C must be assured. This can be easily accomplished by including 6 to 8 ounces of fresh orange juice in the daily diet.

Some authorities believe that a supplementary amount of vitamin B complex is of value. This would be indicated if the patient's appetite is poor.

ANEMIA

Rheumatoid arthritis is often associated with a nonspecific low grade anemia. There is little if any indication for liver therapy, and these patients seldom respond to iron, and then only to extremely large doses. The presence of significant anemia is adequate

indication for whole blood transfusions. Borsi⁸ has reported that blood drawn from a pregnant female seems to have added value. This report is interesting though incomplete. This is also true of the suggested value of folic acid in treating the anemia of rheumatoid arthritis as suggested by Stephens and associates.⁹

PSYCHOTHERAPY

It is only necessary to treat a few patients with rheumatoid arthritis to realize that psychogenic factors play a definite role.^{10, 11} Whether or not these factors represent a situation which parallels the onset of the illness or is one precipitated by the arthritis does not lessen its importance. If the psychogenic disturbance is considered to be a major factor, it is likely that a psychiatrist's assistance will be valuable. Usually, however, the physician treating the patient can, with patience and understanding, accomplish more and give the patient better insight into his problem.

The chronicity of the illness and its crippling tendency usually cause restlessness and anxiety even in the most stalwart patients. Such emotional burdens continually call for realistic reassurance and sensible optimism, which must be ever present in the attendant's approach to the patient.

ORTHOPEDIC APPLIANCES

The use of plaster splinting has already been discussed. Should plaster splinting prove of no benefit in correcting a flexed extremity, in which fixation is not present and the joints are not acutely inflamed, it may be of value to apply light traction. This is usually reserved for correcting flexion deformities of the lower extremities.

If, despite all precautions, a patient shows signs of progressive fixation of the elbows, proper plaster splinting will control the final fixation of the joint in a position in which the extremity will be of most service to the patient. A hand that can be used for feeding and carrying out the required daily ablutions is of value to the patient.

Patients often overcome acute attacks of rheumatoid arthritis, only to be left with one or more joints which retain some sore-

ness or pain, or have a feeling of being "weak." If this occurs in joints of the lower extremities, light calipers, elastic supports, corset-like strappings of the joints or shoe corrections may be helpful. Weak and painful ankles can be supported and made more comfortable. Poor gait and poor posture should be corrected, and this alone alleviates some of the pain associated with walking.

ORTHOPEDIC CORRECTION

It is being more widely appreciated that joints left useless or extremely painful from acute attacks of rheumatoid arthritis can in many cases be corrected by orthopedic surgery. When this stage of treatment is reached, the internist should lean first to the conservative measures, and support the orthopedic surgeon's use of plaster splinting, traction, and mild manipulations. In such instances the internist must be on guard to avoid added trauma to a joint involved by acute inflammation. Each case requires individualization, and the orthopedic consultant should be aware of the pitfalls which are characteristic of the path of treatment of rheumatoid arthritis.

Arthrodesis usually assures the patient a painless joint, but it should be understood that the joint will be frozen and inflexible. An arthroplasty involves more risks, and the patient must be cognizant of the fact that much work will be necessary on his part, that pain may not subside for months, and that if the acute process recurs, the operation will probably result in failure. Osteotomy may be carried out on ankylosed joints to improve the position of the part. This often affords better use of the hands or lower extremities. The attending physician should be ready to suggest these orthopedic procedures, and thereby offer the patient additional help.

QUESTIONABLE ADJUNCTS

Because of the time required to evaluate all methods of treating rheumatoid arthritis, the value of gold therapy remains unproved. Although reliable observers are sincerely impressed with its value, acceptable published reports fail to demonstrate

consistently outstanding benefits. Some supporters of gold therapy believe remissions may be hastened, but they appreciate that a high percentage of relapses is characteristic of the disease. So far continuous treatment with smaller doses of gold has not been carried out sufficiently long for satisfactory evaluation. The argument in favor of gold therapy is well stated by Ragan and Tyson,¹² Hench^{13, 14} and Freyberg,¹⁵ and if the clinician decides on its use, he should familiarize himself with their experiences. However, the clinician should also be aware of comparable results, reported by Short and Bauer¹⁶ which have been obtained without the use of gold therapy. The added dangers of gold therapy must always be considered.

The use of fever therapy by the intravenous injection of mixed typhoid vaccine is not in itself a method of treatment. It is of value though in subacute or chronic cases which are unresponsive to basic therapy. Occasionally, several courses of fever (up to 102° F.) may aid in bringing on a remission, and are of value in demonstrating that the process is usually reversible even if such is only temporary. It is advisable to give no more than six or seven treatments on alternating days. Care must be exercised in patients who are debilitated or have faulty renal or hepatic function.

The use of roentgen therapy in rheumatoid arthritis has not proved as favorable as is reported in rheumatoid spondylitis. Borak and Taylor¹⁷ have reported beneficial results when other methods of treatment failed. Freyberg's¹⁸ results are not as encouraging but he considers its use justified in "certain cases of advanced rheumatoid arthritis."

Endocrines, vaccines, bee venom, cobra venom, sulfur and large doses of vitamin D, given fairly extensive trial, are being discarded. The use of curare as an adjunct to measures previously discussed is now being evaluated¹⁹.

Foci of infection should be handled with the attitude that all efforts are being made to restore the patient to the peak of physical fitness²⁰. Infected teeth as well as

other sites of infection should be eliminated but not at the expense of disturbing the basic program, or traumatizing inflamed joints. Nor should they be corrected if such a procedure may cause a flare-up in the rheumatoid process. Furthermore, it should be understood that elimination of focal infections will not cure the arthritis.

SUMMARY

A basic outline of treatment of rheumatoid arthritis should include: (1) thorough understanding of the disease by the patient, (2) rest, (3) exercise, (4) plaster splinting, (5) analgesics, (6) physical therapy other than exercises, (7) dietary management, (8) treatment of the anemia, (9) psychotherapy, (10) orthopedic appliances other than splinting, and (11) orthopedic corrections. These measures, carried out in an energetic manner, usually result in encouraging improvement and afford the patient full benefit of therapy. The use of such an active basic program helps prevent a feeling of helplessness and discouragement on the part of the doctor, an attitude which could so easily infect the afflicted patient.

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GYNECIC SYMPTOM COMPLEXES*

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Women most often seek medical aid primarily for complaints relative to disease of their female genitalia. Of 1197 patients consecutively examined because of this, in 506, or 42 per cent, other disease entities were found as the cause of their gynecic symptom complexes. To explain this, a brief review of the basic anatomy and physiology of the nervous pathways of the pelvic viscera is necessary.

ANATOMY AND PHYSIOLOGY OF INNERVATION

The somatic innervation applies to both the sensory and motor nerve supply to the body frame, though we are concerned primarily with the sensory innervation. The posterior and anterior rami which arise from the mixed spinal nerves at the intervertebral foramina pass dorsally and ventrally, respectively. The posterior branches are short and supply somatic structures on the dorsal surface of the body. The anterior branches have a much wider distribution. In the thoracic region they run independently, but in other regions they anastomose, giving rise to the complicated cervical, brachial, and lumbosacral plexuses.

The anterior rami from the lumbar and

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sacral portions of the spinal cord and the coccygeal nerve form the lumbosacral plexus. This plexus is the most significant as far as interpretation of the pelvic symptoms of somatic origin is concerned. There are branches which partially supply the quadratus lumborum, psoas major, and minor muscles. The iliohypogastric supplies branches to the peritoneum, the cutaneous areas over the lateral and upper portions of the iliac crest, and the transverse and internal oblique muscles. The ilioinguinal nerve supplies branches to abdominal muscles, the peritoneum, the cutaneous areas of upper and medial parts of the thighs, the mons pubis, and the labia majora.

Branches of the femoral nerve in part supply the iliac and iliopsoas muscles, the hip joint, and cutaneous areas on the anterior surface of the thigh. The obturator nerve gives off a branch to the external obturator muscle before dividing to supply the adductor muscles and cutaneous surfaces of the medial aspect of the thigh.

The sacral plexus sends branches to the pelvic girdle. Its posterofemoral cutaneous nerves supply sensory fibers to the perineum and the posterior surfaces of the labia majora. Muscular branches go to the pyriformis, obturator internus, gemellus, and quadratus femoris. The superior gluteal nerve supplies branches to the gluteal muscles.

From the pudendal plexus, muscular branches go to the levator ani and coccygeal muscle. Visceral branches are given off to the rectum, bladder and vagina. These visceral branches may go to their viscera directly or after a union with the sympathetic plexuses. The pudendal nerves supply sensory branches to the external genitalia, muscles of the anal sphincter, and perineum.

Visceral innervation is effected by the autonomic or involuntary nervous system which can be classified into cranial autonomic, sacral autonomic, and sympathetic proper. The sympathetic nervous system is properly applied to that portion of the autonomic system which lies in the thoracolumbar region. Function-

ally the cranial and sacral autonomic systems are called the parasympathetic system. The sympathetic and parasympathetic systems have antagonistic actions on organs which they supply. In the sympathetic system the excitor cells are located in ganglions which are at a distance from the organs which they supply, whereas the opposite is true of the parasympathetic excitor cells.

The excitor or afferent cells of the parasympathetic system are generally known and understood since they control the changes in the caliber of blood vessels, the activity of sweat glands, and the functions of the bladder and bowel. That this system has afferent neurons and that the efferent excitatory effects occur following receipt in the central nervous system of afferent impulses is often forgotten. The fibers from the viscera find their way to the central nervous system over the same anatomic route as that travelled by the afferent or excitatory fibers except the visceral fibers enter the spinal cord through the posterior nerve roots. It is now accepted that those afferent fibers which are concerned with transmission of the sensation of pain are true sensory fibers and should not be considered as part of the autonomic nervous system except from an anatomic point of view. From this it follows that pain impulses which arise in the pelvic viscera are transmitted by these sensory nerves disguised anatomically as the sympathetic system.

It is known that the superior hypogastric plexus (presacral nerve) forms an anatomic pathway for both the sympathetic and parasympathetic systems of the pelvis. The ovaries and tubes, as one would expect, receive their sympathetic nerve supply from fibers which reach them along the ovarian arteries and which come from the aortic plexus. The neural components which supply the ovary originate mainly from the tenth thoracic nerve, and those of the tubes from the eleventh and twelfth thoracic nerves. Obviously then neurectomy in the interiliac trigone will not relieve pain originating in the ovaries and tubes.

INTERPRETATION OF PAIN STIMULUS

Interpretation of a pain stimulus demands consideration of its (1) severity, (2) duration, (3) location, and (4) quality. Pain which arises in superficial somatic structures can be adequately evaluated as to these characteristics. Cutaneous pain is always of the same quality no matter what the etiology may be, and is not difficult of localization. Pain arising in muscle is disagreeable and fluctuating and more difficult to localize. Pain which arises in deeper structures is difficult to characterize and it is necessary to consider the mechanism of direct and referred pain.

More or less argumentative ideas concerning visceral pain have been part of our medical history. Early authors denied that pain could arise directly from a viscus. Now most authorities accept two types of visceral pain, direct and referred. It is suggested that the viscera have not a sense of localization of pain. The stimulus may be conducted to that portion of the spinal cord from which the sympathetic nerves that supply the origin are given off and irritability may be set up on that segment of the cord. Thus the stimuli may be distributed as referred pain to regions served by that segment of the cord.

It is known that viscera are insensitive to such stimuli as cutting, burning, and crushing, yet are sensitive to adequate stimuli which threaten to interrupt ordinary physiologic processes. These stimuli produce direct pain. Such stimuli are rapid distention or vigorous contraction of hollow viscera, rapid stretching of the capsule of a solid viscus, and anoxemia of functioning muscle tissue.

Even with combined reflex and direct sympathetic nerve response to pain, the pelvic organs remain relatively insensitive to pain. Much of the sensation of pain from visceral entities is owing to the somatic pain produced by stretching. In seeking the etiology of pelvic pain and evaluation of its degree, intangible factors as well as pathologic changes in the viscera must be

considered. In certain cases in which the complaint is of so-called uterine or ovarian pain, the etiology may be psychic or psychosomatic. Violent emotions accompanied by vascular contraction of surface vessels and of the vessels of internal organs may give rise to pain stimuli.

Thus with this review as a background, it can easily be recognized why a considerable number of patients describe the origin of their complaints as being related to their female genitalia. The most important phase of a gynecologic survey in any patient is a thorough history and physical examination with particular emphasis on the genitourinary, the gastrointestinal, and neuromuscular systems. From these systems come the entities that produce gynecic symptom complexes,

UROLOGIC DISEASE

Experience has demonstrated that disease of the urethra, bladder, ureters, and kidneys produces symptoms which are indistinguishable from gynecologic disease. The cramping pain, and the constant dull ache in the suprapubic area with referral to the lateral areas of the abdomen and the interior surfaces of the thighs may be the result of urologic as well as pelvic disease. Frequently urologic disease of this type is exaggerated at menses to focus the patient's attention to it. Little need be said concerning ureteral strictures and stones as concerns their confusion with gynecologic entities. Nor should it be necessary to recall that often ovarian neoplasms are discovered at laparotomy to be pelvic kidneys. In 226 instances, or 44 per cent of the 506 patients who had gynecic symptom complexes, there were proved urologic entities as noted in Table 1. It should be a constant thought that these urologic entities are commonly present and every effort made to eliminate them as a cause of pelvic complaints before ascribing these complaints to disease of the generative organs. Of these cases, 20 had been advised that pelvic surgery was necessary.

TABLE 1
GYNECIC SYMPTOM COMPLEXES DUE TO
UROLOGIC STATES

	Cases	Percentage
Posterior urethritis	171	75.6
Urethral strictures	12	5.4
Huhner's ulcer	3	1.3
Interstitial cystitis	4	1.8
Ureteral strictures	6	2.6
Ureteral stones	2	.9
Renal infection	22	9.7
Renal ptosis	2	.9
Congenital anomalies	4	1.8
Total	226	100

BACKACHE

Backache is usually considered by women as being a symptom of gynecologic disease, yet nothing is more fallacious. It is true that at menses many women complain of backache. However, when closely interrogated these same patients admit its presence on exercise or strenuous work also. Very few, if any, gynecologists today consider low backache a gynecologic complaint. Interesting enough is the concomitant presence of other gynecologic entities such as small myoma, functional ovarian cysts, and retropositions with nucleus polposus, lumbar disc, congenital anomalies, and postural defects. The rest experienced after surgery, or in many instances the use of the knee-chest position advised for the gynecologic entities mentioned, affords relief only temporarily to these patients. A thorough orthopedic examination will frequently spare patients unnecessary surgery.

Backache was noted as a complaint in 220 cases. After examination by a competent orthopedist it was noted that the etiologic causes were as noted in Table 2.

TABLE 2
GYNECIC SYMPTOM COMPLEXES DUE TO
ORTHOPEDIC STATES

	Cases	Percentage
Postural	140	64
Mechanical	60	27
Infection	18	8.1
New growths	2	.9
Total	220	100

DISEASES OF RECTUM AND SIGMOID

Since the rectum and sigmoid are a part of the pelvic viscera and a frequent site of

disease, it is not unusual to have gynecic symptom complexes as a result. In 60 such instances rectal and sigmoid entities were found to be the etiology of such pelvic complaints as pain, dyspareunia, dysmenorrhea, and bleeding. In Table 3 are noted the types of disease present.

TABLE 3
GYN-LIKE COMPLAINTS DUE TO MEDICAL STATES

	Cases	Percentage
Colitis	40	67
Diverticulitis	8	13
Amoebiasis	5	8
Carcinoma bowel	3	5
Polyps bowel	4	7
Total	60	100

Not unusual is it to find carcinoma of the rectum considered as tubal or ovarian disease. Diverticulitis is a common disease in women past 40 years of age at which time we are likely to confuse it with genital disease.

PSYCHIC CAUSES

In this day of tension one must think of psychic disorders as Locke has recently noted a high incidence of psychic disturbances in gynecologic patients. A word of caution should be raised, however, that only after very thorough and painstaking search for the etiology of pelvic complaints should the psychic element be considered.

Therefore, it is advised that women with gynecic symptom complexes be given the benefit of a thorough general survey before ascribing the etiology to doubtful genital disease.

SUMMARY

1. An examination of 1197 consecutive patients with gynecic symptom complexes discloses 502, or 42 per cent, to have other entities than disease of the genitalia responsible for the complaints.

2. A review of the nervous pathways of the pelvic viscera is presented in order to aid in this discussion.

3. Gynecic symptom complexes such as pelvic pain, backache, dysmenorrhea are often due to disease of genito-urinary, orthopedic, or medical systems.

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DISCUSSION

Dr. Jack R. Jones (Baton Rouge): Very often the gynecologist as well as the general surgeon becomes so engrossed over the symptomatology of a gynecologic condition that he is blinded to the existence of other entities. This report by Dr. Guerriero should awaken all of us to the fact that the subjective symptoms and the objective findings may vary in different individuals and in different disease syndromes. Dr. Guerriero reports that 42 per cent of 1197 gynecologic patients examined consecutively had other causes for their complaints. This means that approximately every other patient seen by the gynecologist has a non-gynecologic condition causing her symptoms. The urological conditions causing symptoms of a gynecic-like nature are well recognized. However, there is often a reverse of affairs. Many cases of cystitis are secondary to a chronic cervicitis or other uterine disease. We must then agree that many conditions causing symptoms are interrelated and occur concomitantly. I find orthopedic and neurologic problems account for a larger percentage of gynecic-like complaints. The lumbar vertebrae are probably exposed to a greater active and passive trauma than all the other parts of the spine. Thus, the nerve roots will be irritated often. Clinically neuralgia affects the twelfth dorsal and first lumbar nerves more frequently perhaps, than any of the other nerves. If we consider the segmental distribution of these nerves, many complaints referable to the lower quadrants of the abdomen, the groin, the upper inner thigh, the costal-vertebral angle, and the iliac crests will be appreciated and a correct diagnosis made. Not only are the severity, duration, location and quality of pain important, but we should differentiate between pain per se and pain with tenderness. Failure to attempt to elicit tenderness will give an incomplete picture of the involved spinal segments, allowing us only to direct our attention to the areas of spontaneous pain. If doubt exists, a paravertebral nerve root block of the twelfth thoracic and first lumbar will often clarify the picture. Neuropsychiatric patients will frequently project their complaints to the pelvis. Many such patients have been exposed to useless surgery by an over zealous surgeon. However, one must be very careful in making a snap psychiatric diagnosis. As stated by Dr. Guerriero, this diagnosis should only be made

after exhausting all methods of investigation. This paper should stimulate the desire of every physician to obtain a more careful history and to perform a more complete physical examination in order that he may not be embarrassed too often in making a wrong diagnosis.

Dr. Perry Thomas (New Orleans): Gentlemen, it is good to see that gynecologists are beginning to realize that females have other organs aside from a uterus, tubes and ovaries. Dr. Guerriero has pointed out that gynecologic back complaints are extremely frequent but these are usually easily diagnosed and recognized. Among those which are not commonly diagnosed and recognized are those due to orthopedic lesions appearing in the female body. As a general rule a diverticulitis in the colon can be picked up with a fair degree of ease. Urologic disease is not too difficult to discern; but the so-called neuralgic disorders of the anterior abdominal wall create the greatest confusion. Dr. Guerriero mentioned these briefly. It is interesting to recall the work of Judavich and Bates at the University of Pennsylvania who established a neuralgic clinic and who recently published a little text on *Segmental Neuralgia Painful Syndromes*. It has been my experience that the vague complaints located in the anterior abdominal wall, particularly in the lower portion, are usually associated with backache; that there is always an associated hyperesthesia of the involved portion of the abdominal wall over which the pain is located; that it is practically always associated with a scoliosis of the spine; and almost universally with a shortening of one extremity. A simple matter of placing a heel lift under one heel, leveling the pelvic girdle, and correcting the inequality of leg length, has relieved a large number of these complaints. In some instances, the use of a heel lift alone has not been entirely satisfactory; although it partially relieves the pain it does not completely do so. In such instances the use of a lumbar sympathetic block has in every instance completely relieved the pain. Under these circumstances, it is important that we as gynecologists test the sensitivity of the skin in the anterior abdominal wall. Judavich and Bates have pointed out the double innervation of the segmental areas of the body wall; they have pointed out the fact that there is superficial as well as deep hyperesthesia and have described the methods and means of eliciting them. It is well to remember that the orthopedic lesions are not only responsible for backache in women but can be responsible for pain in the anterior abdominal wall as well. It is usually

of the vaguest type, and its characteristics are not clear even in the mind of the woman herself.

Dr. Guerriero (in conclusion): I would first like to thank Dr. Jones and Dr. Thomas for their interesting discussions. I had one purpose in presenting this subject this morning, and that was to actually bring to you the thought and feeling that all complaints in the region of the female genitalia are not necessarily gynecologic in origin. Unless one definitely finds reasons and causes on pelvic examination to explain the complaints, the patient should

at least be given the benefit of careful observation before being exposed to laparotomy. Often one will find that in a period of time these complaints will belong in other areas of the body and not in the female genital tract.

It has certainly been a pleasure to return to my home and to my state once again to take part in this medical program, and I have thoroughly enjoyed my visit with everyone. I appreciate the compliment of being asked to attend, and hope that I may return again some day.

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AUREOMYCIN

In the past two years, three important new antibiotics have been presented. Of these, polymyxin is being studied, but presently is regarded as too toxic for clinical use. Aureomycin and chloromycetin are available to physicians. The results obtained with both are being observed with great interest.

Aureomycin is derived from the ultramold, *Streptomyces aureofaciens*, and has been developed in the Lederle Laboratories. It appears to be effective in certain types of diseases, or infections, where the antibiotics in more common use have not been of value. It is a yellowish crystalline substance. It gives promise of being one of the most versatile of the antibiotic drugs. It is effective against many Gram negative

and Gram positive organisms. It is also regarded as valuable against many rickettsial infections. It has been reported as being useful in primary atypical pneumonia. It has been found to be of service against certain infections which have become resistant to penicillin, streptomycin, and the sulfonamides. The measurement of its effectiveness in comparison with the other antibiotics is awaited.

Among the rickettsial diseases it has been found by several groups of workers to control Rocky Mountain spotted fever, Q fever, endemic typhus, a relatively new disease known as rickettsialpox, and also, lymphogranuloma venereum. In this latter disease, it appears to be superior to all other forms of therapy. Among other advantages that the drug has in this condition is that it is effective against a variety of secondary invaders.

Comparative tests have been done *in vitro*. Against streptococci, pneumococci, and staphylococci, aureomycin was found to be four to sixteen times as active as chloromycetin; only one-tenth to one-eightieth as effective as penicillin against these same organisms. When Gram negative organisms were tested, the bacteriostatic activities of aureomycin and chloromycetin were comparable, in many instances. However, against *Proteus vulgaris* and against *Pseudomonas aeruginosa*, aureomycin was not effective. In experimental animals, aureomycin was found to have marked therapeutic activity against the entire group of psittacosis-lymphogranuloma viruses.

The clinical use of the drug in various disease states indicates many fields in which it will be of value. Its use has been followed by symptomatic and bacteriologic control of acute and chronic brucellosis in the majority of patients. In Rocky Mountain spotted fever, the average duration of fever after the administration of the drug was two and a third days, in a certain group of cases. In primary atypical pneumonia, in a group of 13 patients, there was a progressive decline in symptoms and in fever over a period of approximately seven days.

One patient with endemic typhus, in an advanced stage of the disease, was treated with quick relief and recovery. Three patients with tularemia, in a serious phase of the disease, were treated with effective relief. The same authority found that the survival time in mice, experimentally infected with tularemia, was greater with aureomycin than with any of the other antibiotics used. In a variety of enteric infections, including typhoid fever and Salmonella infection, the results indicated that aureomycin may have had some beneficial effects. Further observations were necessary to determine its comparative value. In a large variety of ocular infections, Braley and Sanders found rapid improvement, using 0.5 per cent solution.

Aureomycin is administered at present by mouth. In severely ill patients the schedule tentatively is based on the formula of 60 mg. per kilogram of body weight per day. It is suggested that one-sixth of the

total daily dose be divided into three parts and given at hourly intervals for the first three hours. Following this, one-sixth of the twenty-four hour dose should be given at four hour intervals until the temperature has been normal for twenty-four hours. At this time, the dose should be reduced by one-half. For patients less acutely ill, a dose of 30 mg. per kilogram of body weight is suggested.

Aureomycin appears to be a valuable addition to the number of antibiotics now in use. Its field of special value seems to be in the rickettsial diseases and the viruses. It also gives promise of being very helpful in those infections which have become resistant to other biological antibiotics and the sulfonamides. Toxic effects appear to be limited to the gastrointestinal tract, in which vomiting and diarrhea have been reported. These are easily controlled in many patients by the use of preparations containing aluminum hydroxide.

ORGANIZATION SECTION

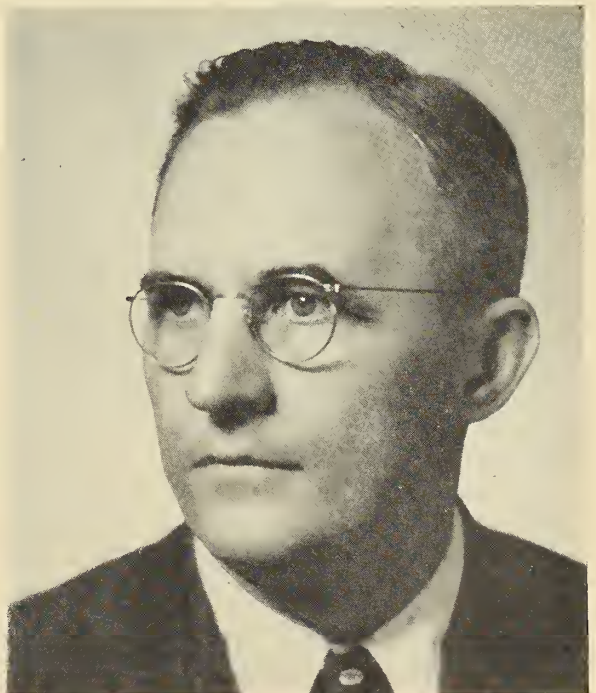
The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

Our President, Dr. M. D. Hargrove, will relinquish his official duties at the termination of our meeting in May. Dr. Hargrove has had an intense and responsible service during the past year, probably one of the most important in the history of our organization. During his time of office he has displayed active and serious interest in the many problems confronting the Louisiana State Medical Society. His handling and solution of these problems is an evidence of his ability to guide the State Society through one of its most trying periods. Under his mature guidance the various functions and activities of our Society have expanded.

Dr. Hargrove came into this important office well trained for his responsibilities. His early school and medical training were obtained in a hard way. The many rewards which he received as a result of his application are a suitable testimonial to his sincerity, honesty and integrity, whether as a

PRESIDENT HARGROVE



scholar, teacher, practitioner of medicine, or the holder of important offices in the State Society.

He was born in Natchitoches, La., on November 8, 1894, the son of Dr. J. B. Hargrove. Unquestionably his desire to become a doctor was inherited from his wonderful father. He graduated from the Natchitoches High School in 1911. He then took up school teaching and taught in the public schools in this state from 1913 to 1917. These services were interrupted by the First World War. He volunteered for military service early and received his training in the First Officer's Training Camp and was commissioned Lieutenant in the Infantry. He served with distinction and credit to his country in the 347th Regiment, 87th Division. He received an honorable discharge in February 1919. In the same year he entered the medical department of Tulane University and graduated with high honors in 1923. He was recognized as an outstanding student at that time and had the distinction of being president of his senior class in 1923. For his outstanding record in medical school he was elected to the honorary fraternity of Alpha Omega Alpha, and the Stars and Bars. He was an ardent member of the Sigma Nu academic fraternity and Phi Chi medical fraternity. With this wonderful background he went to his present location, Shreveport, La., where he took his internship at the North Louisiana Sanitarium. He has practiced medicine continuously in Shreveport since 1923, specializing in cardiology. His professional activities have been distinguished in Shreveport and its environs. Having established himself early as an outstanding and sympathetic practitioner of medicine, he soon obtained the devotion of his friends and his confreres as well as the love and admiration of his patients.

It is of interest to note just a few of the honors which he has received from the medical profession since his graduation. He was president of the Shreveport Medical Society in 1941. He was councilor to the LSMS from the Fourth District for

several years. Subsequently, he was elevated to the vice-presidency of the LSMS and later elected as vice-chairman of the House of Delegates. In 1946 he was chosen without opposition as president-elect of the LSMS. Since his early days as councilor, vice-president of the House of Delegates, and as president-elect of the LSMS he has continued to serve as a member of the executive committee. This gave him sufficient training and knowledge of our organization to prepare him for the arduous and important duties which are involved in the work of president of our organization. During the coming year he will continue to serve as a member of the executive committee as past president. His distinguished services in Shreveport are and continue to be recognized. He is now Chief of the Medical Service of the Shreveport Charity Hospital. He is also a licensee of the American Board of Internal Medicine. He has been a most energetic member of the American Legion.

For a number of years Dr. Hargrove was editor of the Tri-State Medical Journal, published in Shreveport. This monthly periodical disseminated scientific and organizational information for the Tri-State Medical Society, serving the Eastern portion of Texas, Southern portion of Arkansas and Northern Louisiana. He has also contributed numerous articles and material to our state and national medical journals, all of a high scientific and material value to the medical profession.

With the above professional attainments it is obvious that he would be a hard, sincere and ardent participant in church work. He is a prominent member of the Methodist Church and has served on its Board of Stewards for a number of years.

By his marriage to Deryl D. Buford he was blessed with two sons, Marvin D. Hargrove, Jr. and Robert D. Hargrove. Following in the footsteps of his worthy grandfather and father, it is very interesting to note that Marvin D. Hargrove, Jr. will soon become a medical student. It is hoped that the character of service rendered to the public and to the medical profession,

so wonderfully portrayed in the life of M. D. Hargrove, will be manifested in the future careers of his sons. Our organization will certainly miss Dr. Hargrove's active participation in its work. However, we know that he will continue to give whatever help and support is needed to our organization for its continued advancement.

ANNUAL MEETING

New Orleans and the physicians of the Orleans Parish Society are greatly pleased over the prospects of the 1949 annual meeting of the Louisiana State Medical Society to be held in New Orleans at the Roosevelt Hotel May 5-7. Judging from the number of hotel reservations requested and interest manifested in various ways, a large attendance is expected and Dr. Robert F. Sharp, Chairman of the Committee on Arrangements, reports that plans are complete for an excellent scientific program and the other features of the meeting promise to be entertaining and highly enjoyable.

Mr. Robert F. Hurleigh, News Director of Radio Station WGN in Chicago, has been invited to address the opening meeting of the Society on Thursday night, May 5. Mr. Hurleigh is a well known and outstanding speaker and it is certain that his talk will be of interest to everyone in attendance. This will be an open meeting, to which the public is invited, and it is hoped that all members of the organization will come and bring guests with them. It is planned at this meeting to present an award to Dr. Charles M. Horton, of Franklin, who was selected as the outstanding general practitioner in the state for 1948. Also, lapel pins will be presented to all members of the organization who have practiced medicine for fifty years or more.

Six out-of-state speakers have been invited to participate in the scientific sections: Dr. Merrill W. Everhart, Dallas, Texas—Pediatrics; Dr. Martin H. Fischer, Cincinnati, Ohio—General Practice; Dr. Arthur B. Hunt, Rochester, Minnesota—Obstetrics; Dr. Robert Lich, Jr., Louisville, Kentucky—Urology; Dr. E. Sterling Nichol,

Miami, Florida—Medicine; Dr. Oran V. Prejean, Dallas, Texas—Gynecology. These men are scheduled to present papers on important subjects of current interest and there is no doubt but that their presentations will be outstanding.

Following is a synopsis of the meeting, including meetings of the House of Delegates, scientific sessions, and entertainment. Thursday, May 5:

8:00 a. m.—Registration

9:00 a. m.—House of Delegates

12:00 Noon—Luncheon for House of Delegates

2:00 p. m.—House of Delegates

8:00 p. m.—Opening Meeting of Society

Friday, May 6:

8:00 a. m.—Registration

9:00 a. m.—Scientific Program—Surgery

12:00 Noon—Luncheon for members

2:00 p. m.—Scientific Program—Medicine

8:00 p. m.—President's Reception and Dinner-Dance

Saturday, May 7:

8:00 a. m.—Registration

9:00 a. m.—Scientific Program

Bacteriology and Pathology

Dermatology

Gastro-Enterology

La. Heart Association

Pediatrics

9:30 a. m.—Scientific Program—Urology

10:00 a. m.—House of Delegates

2:00 p. m.—Scientific Program

Academy of General

Practice of Louisiana

Ear, Nose and Throat

Eye

Gynecology

La. Allergy Society

Obstetrics

The meeting of the American Academy of General Practice of Louisiana, as noted above, will begin on Saturday afternoon, May 7, and this group will continue their meeting with a dinner on Saturday night

and scientific, business and installation meetings on Sunday, May 8.

Other special groups will hold luncheons and dinners during the three day session of the State Society.

Members who have not yet requested hotel reservations should do so at once. Such

requests should be sent to the office of the State Society, 1430 Tulane Avenue, New Orleans and confirmation of reservations will be sent to the doctors by the hotels.

All members and their wives are urged to attend and a cordial welcome from the New Orleans Society is extended to all.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

SPECIAL TRAIN SERVICE TO AMA MEETING

The Louisville and Nashville railroad will furnish a through Pullman service to Atlantic City for doctors attending the AMA meeting there on June 6-10, 1949 if there is a sufficient number of doctors who will use this service. The train will leave New Orleans on the night of June 3, at eleven o'clock and a special Pullman car will go straight through to Atlantic City, without change, arriving at ten-thirty on the morning of June 5. This arrangement is predicated on the number of doctors who desire reservations and all interested should call the office of the State Society, Magnolia 4891 or send a letter to the Secretary at 1430 Tulane Avenue, New Orleans in order that requests may be recorded and reservations handled.

NEWS ITEMS

Dr. T. A. Watters read a paper entitled "The Obligations in Being a Good Teacher" before the faculty and student body of the National College of Education of Evanston, Illinois on February 23, 1949.

Dr. T. A. Watters was recently elected to membership in the Chicago Psychoanalytic Society.

Dr. Daniel N. Silverman addressed the New Orleans Rotary Club and the Drug Travelers Association on "Socialized Medicine—Its Effects on the American People".

Dr. Paul L. Getzoff was recently made a diplomate of the American Board of Urology.

DOCTOR WANTED

Young doctor with at least two years general or surgical internship wanted for permanent position in industrial surgical office in New Orleans. Contact office of the New Orleans Medical and Surgical Journal for further information.

DOCTOR NEEDED

There is need for a young, active and energetic doctor in the town of Cut Off, Louisiana. For further information communicate with Mr. Taylor J. Plaisance, R.R. No. 1, Cut Off.

ETHICAL ADVERTISEMENTS

Important messages are presented in the advertisements in our journal each month. New products are announced from time to time and information is presented regarding the use of products featured. Other types of ads emphasize services rendered and commodities offered that may be used in your practice, in your office, and in your home. Doctor, you can rely on the statements and facts presented. We aim to include only ethical advertisements in our journal. Please tell the advertisers that you saw their ads in the New Orleans Medical and Surgical Journal.

NEW OFFICERS OF COMPONENT SOCIETIES

The following officers have been elected by their respective parish societies to serve for 1949:

Iberia Parish Medical Society

President—Dr. Jules Dupuy, New Iberia
 Vice-Pres.—Dr. H. M. Flory, New Iberia
 Sec.-Treas.—Dr. R. V. St. Dizier, New Iberia

Iberville Parish Medical Society

President—Dr. F. O. Tomeny, White Castle
 Vice-Pres.—Dr. W. E. Barker, Plaquemine
 Sec.-Treas.—Dr. E. C. Melton, Plaquemine

Vermilion Parish Medical Society

President—Dr. Thomas Latiolais, Sr., Kaplan
 Vice-Pres.—Dr. Shelly Mouldous, Abbeville
 Sec.-Treas.—Dr. James R. Nunez, Abbeville.

Fifth District Medical Society

President—Dr. Carl L. Langford, Ruston
 Sec.-Treas.—Dr. F. E. McCarty, Monroe

Sixth District Medical Society

President—Dr. Guy Riche, Sr., Baton Rouge
 Sec.-Treas.—Dr. J. D. Thames, Hammond

Seventh District Medical Society

President—Dr. A. H. LaFargue, Sulphur
 Vice-Pres.—Dr. K. M. Lyons, Sulphur
 Sec.-Treas.—Dr. J. B. Hodge, Jr., Sulphur.

HARRY PUGH FORSYTH

1897—1949

The Rapides Parish Medical Society has reported the death of Dr. Harry P. Forsyth of Alexandria in March, 1949. Dr. Forsyth was a graduate of Tulane School of Medicine and graduated with the Class of 1929. He was a member of the State Society since 1930.

WOMAN'S AUXILIARY TO THE AMERICAN ACADEMY OF GENERAL PRACTICE

Cooperation was the keynote as the wives of general practitioners throughout Louisiana organized for auxiliary activity preliminary to the gathering at the First Annual Convention to be held in the nation of a Woman's Auxiliary to the American Academy of General Practice.

Following the lead of Mrs. J. M. Bodenheimer and the enterprising women of the Fourth District, the group comprising the Sixth District under Mrs. Thomas Y. Gladney of Baton Rouge, joined their husbands at dinner preceding the regularly scheduled meeting of the doctors. They listened to an inspiring speech by Mrs. George D. Feldner, membership chairman for the state and guest of honor for the evening, and achieved a one hundred per cent auxiliary membership of the wo-

men present.

Emulating the spirit of camaraderie which prevailed at the meeting reported above, the Second District women, under the leadership of Mrs. Earl J. Clayton of Norco, have received an invitation for a dinner date with their general-practitioner-husbands to the regularly scheduled April meeting of the group. Councilors of the remaining unorganized districts may well profit by the example of these pioneers, and assure attendants at the forthcoming convention who will be prepared to formulate ideals and ideas for the conduct of the newly formed auxiliary. Literally, the eyes of the nation will focus upon the New Orleans gathering, May 7 and 8, as throughout the country auxiliaries will conform with the procedures developed at this first annual convention.

Under the co-chairmanship of Mrs. George Feldner and Mrs. Daniel J. Murphy, the women of First and Second Districts have prepared a full program for the delegates and members attending the convention. Registration will be handled with the object of getting acquainted with the registree and assisting her with sightseeing, shopping, and other information which would make her stay in New Orleans profitable as well as pleasant. A patio party to be held Saturday afternoon will honor Mrs. M. C. Wiginton as the first auxiliary president in the nation. It will provide an opportunity for intimate acquaintanceship among the members. That evening at the invitation of the Louisiana Chapter of the American Academy of General Practice, the ladies will join their husbands at dinner. Dancing will follow in the spacious ballroom of the Roosevelt Hotel.

On Sunday morning at nine-thirty the general session business meeting will be held in the Pan-American Room of the Roosevelt Hotel. A board meeting scheduled for the latter part of March is proposed to iron out problems of organization so that the general body will not have to submit to long drawn out procedures. Mrs. Wiginton and the other officers promise efficient conduct of the meeting with ample opportunity for any member to air her views and to submit ideas for consideration.

Members of the convention committee will serve as hostesses at the patio tea with their daughters as tea girls. These will include Janelle Hindelang, Barbara Nell Massony, Monja Gray, Patricia Murphy, Pamela Ann Jones, Antha Ann and Mary Gaylord Sanders.

Publicity for the convention and general news of the district groups will be gratefully received by Mrs. Edwin R. Guidry, 720 Broadway, New Orleans (Walnut 4590). Mrs. Guidry is acting as publicity chairman for the period of convention preparation.

WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

WOMAN'S AUXILIARY

The wives of the visiting physicians here for the twelfth annual meeting of the New Orleans Graduate Medical Assembly were the guests of honor at the monthly program-reception of the Woman's Auxiliary to the Orleans Parish Medical Society. The Queens and Maids of the 1949 Carnival Season presented in their royal regalia were Misses Katherine Talbot, Odile Jaubert, Eloise Tyrone, Joan Favrot, Claire de la Vergne, Eve Butterworth, Patsy Brown, Isabelle Ochsner, Alice Anderson, Joel Doell, Adele Broas, Jane Waguespack, Patsy Murphy, and Carol Gelbke. The trainbearers were Miss Mary Gayle Sanders and Miss Antha Sanders and the pages were Master Esmond Fatter, Jr. and Master Joseph B. Vella. Mrs. Boni J. De Laureal, entertainment chairman introduced Mrs. Rodney Touns who acted as Mistress of Ceremonies. Miss Constance Carter, Newcomb College musician, provided the musical background. The rooms were lavishly decorated to depict a Chinese garden.

The Woman's Auxiliary to the East Baton Rouge Parish Medical Society was hostess to some 300 guests at a Guest Day Coffee and meeting in March. Dr. Charles McVea, president of the East Baton Rouge Parish Medical Society, introduced Dr. Daniel J. Fourrier, who spoke on "The Medical Society's Stand on Socialized Medicine." A report was given by Mrs. Arthur D. Long, State Legislative Chairman. The topic of her talk was "Changing Political Philosophy as Reflected by the Social Medical Legislation in the 81st Congress." Mrs. Long's speech will be printed in the next issue of "News and Views" and may be used as material for local Auxiliary study.

Congratulations are in order for the 100th Anniversary of the founding of the Shreveport Medical Society and the splendid newspaper section consisting for forty pages published by the Shreveport Times, February 24, 1949 commemorating this anniversary. Many copies were mailed throughout the state and I hope all Auxiliary members will have an opportunity to see a copy before or during the State Convention May 5, 6, and 7th. The Woman's Auxiliary to the Shreveport Medical Society has been organized since 1928 with Mrs. A. A.

Herold as the first president and Mrs. Jos. E. Heard now serving as president. This Auxiliary has contributed its share towards the success of the Society. Their program for the month will be held on Doctor's Day, March 30th, in honor of their doctors.

A few more months, and the members of the Woman's Auxiliary to American Medical Association will be arriving in Atlantic City, New Jersey for their Annual Convention, June 6th to 10th.

Have you made your reservations? It not, send your request *at once* to Dr. Robert A. Bradley, Chairman, Subcommittee on Hotels, 16 Central Pier, Atlantic City, New Jersey.

May 5th, 6th and 7th are the dates for the Louisiana State Medical Society Convention in New Orleans, at the Roosevelt Hotel. Auxiliary Registration and Pre-Convention Board meeting will be held Thursday. General Session of the Auxiliary will be held Friday morning with a Tea and Style Show at the Orleans Club in honor of Mrs. John Dunn, incoming president. A Post-convention Board Meeting is scheduled for Saturday morning followed by a luncheon at the New Orleans Country Club.

In the March 5, 1949 issue of the Journal of the A. M. A. may be found a special article by Morris Fishbein, M. D. on *Medicine Under The British National Health Act*. In Collier's for March 5, 1949 may be found an article by Lester Velie, on *Is England's Socialized Medicine Working? Socialistic Medicine in England-Personally Observed* by Robert E. S. Young, M. D., President of the A. A. P. S. is a third article on British Medicine worthy of your consideration and study. A fourth article may be found in the March 21, 1949 issue of Time which devotes several pages to *Britain's Health Minister Bevan*.

Auxiliary members regret to learn of the death of Dr. H. P. Forsyth, Chairman of the Advisory Board to the State Auxiliary and husband of our State Treasurer. Sincere sympathy is extended to Mrs. Forsyth and members of the family.

Grace D. Darby,
Press and Publicity Chairman.

BOOK REVIEWS

Gynaecological and Obstetrical Anatomy: By C. F. V. Smout, M. D., M. R. C. S., Baltimore, The Williams & Wilkins Company, 1948, pp. 248. Price, \$11.00.

Stressing the gynecological and obstetrical implications of the anatomy of the female pelvis, this second edition also covers such subject matter as

the placenta, the anatomy of the fetus in its relation to childbirth, and ovarian endocrine function.

A sound basic knowledge of topographical anatomy is the fundamental foundation for successful practice, and the clinical application of the subject has been emphasized more than in the average text of this type.

Illustrations numbering 185, most of which are original, enhance the value of this book which fulfills a definite need. The price is out of proportion to the size of the text.

EUGENE H. COUNTISS, M. D.

Microbiology and Pathology: By Charles F. Carter, B. S., M. D. 4th Ed., St. Louis, C. V. Mosby Co., 1948, pp. 845. Price, \$5.00.

This is an excellent textbook designed for students of nursing. It presents in compact fashion the general principles of microbiology and the relationship of microorganisms to disease, sanitary bacteriology, and the salient features of the major infectious diseases. There are good chapters on the collection and handling of specimens for bacteriological examination, also methods for practical sterilization and disinfection of equipment used in hospitals and the physician's office, the patient's discharges and his environment.

The section on pathology includes a chapter in the work of hospital pathologists as well as a discussion of the basic features of pathologic tissue responses and the specific responses in vitamin deficiencies, infectious diseases, neoplasia, congenital defects and diseases of the respective organ systems.

The style is clear and simple; the illustrations are numerous and well-selected. The book may be recommended highly and it should have a wide use.

M. F. SHAFFER.

The Clinical Management of Varicose Veins: By David Woolfolk Barrow, M. D. New York, Paul B. Hoeber, Inc., 1948. Pp. 155, illus. Price, \$5.00.

This is a concise, lucid, and effective short monograph on the subject with chapters on the history and anatomy, the physiology, the pathology, as well as the symptomatology, examination, and treatment of patients with this disorder and its various complications. The physiologic considerations are perhaps the most interesting feature of the book and the author discusses, rather thoroughly, this somewhat controversial phase of the problem. It is unfortunate that the pressure phenomena in normal and varicose veins should be subject to contradictory reports by various workers. The author feels the evidence for the assumption that the pressure is increased in patients with incompetent communicating veins or with incompetencies of the superficial veins is sufficient to warrant treatment based on the thesis that the underlying difficulty in severe and complicated varicosities is the increased pressure in the venous system. On this basis he recommends frequent ligation of the superficial femoral vein as well as a radical attack on the saphenous systems. He recommends extensive stripping of the internal and external venous

veins rather than operative division of the communicating veins, or excision of the superficial veins. The abandon with which this stripping is recommended without ligation or suture of ruptured tributary veins is a little startling.

The material is well presented and well illustrated and should be easy to assimilate. It is presented from a simple and noncontroversial point of view.

PAUL T. DECAMP, M. D.

Neurosurgical Pathology: By I. Mark Scheinker, M. D., Springfield, Ill., C. C. Thomas, 1948. pp. 355. 238 illus. Price \$8.75.

Although Scheinker states that his "main effort has been to establish a functional, dynamic approach to Neuropathology," he has limited this text on "Neurosurgical Pathology" to his cross-bearing on the dynamic aspects of cerebral swelling. He does, however, admit that he "recognizes only too well his own limitations in dealing with so complex a problem." It would seem, therefore, that the text should be more accurately titled to indicate the true contents of the book.

In the chapter on "Intracranial Tumors" Scheinker has attempted, as stated in the preface, "to present . . . the fundamental characteristic histopathologic features of the more frequently observed tumors—based exclusively upon the use of preparations stained with hemotoxylin and eosin." However, detailed descriptions of cellular pathology are not to be found in this chapter.

The text is amply illustrated with photographs of which the photomicrographs are especially good. An extensive bibliography is appended.

For the neurosurgeon in need of the further word on neurosurgical pathology, this book is not recommended.

FREDERICK C. REHFELDT, M. D.

Detailed Atlas of the Head and Neck: By Raymond C. Truex, Ph.D. and Carl E. Kellner. New York, Oxford University Press, 1948. pp. 162. Illus. Price \$15.00.

This book is the product of several years of teamwork by an excellent anatomist and a very capable artist, members of the Anatomy Department staff at Columbia University.

It is not just another atlas. There are several unique features. The plates are arranged in four sections: Regional Anatomy, Skeletal Structures, Frontal Sections and Transverse Sections. Approximately one-half of them depict the regional anatomy of the various areas of the head and neck in successive layers as they would appear in a laboratory dissection. Included in the explanations of many of these illustrations are cross references to plates showing frontal and transverse sections which are valuable aids in obtaining a three dimensional concept of the relations of

structures under consideration. The views of the brain and its blood supply, the cranial fossae and their relations to adjacent structures, the pterygoid area and associated regions are especially instructive. The section on skeletal structures has been confined to ten excellently drawn and labeled views of the skull and illustrations of the cervical vertebrae, ear bones, and the hyoid bone. The frontal and transverse sections have been closely enough spaced to allow tracing of most of the important structures from one level to the next without difficulty. Printing the vessels and nerves in color adds to the usefulness of the pictures of these sections. The atlas is fully indexed.

In the words of the authors, this volume is specifically "designed to aid both the practitioner and the student to gain a more lasting understanding of the intrinsic anatomy of the head and neck."

ADRIAN F. REED, M. D.

A Method of Anatomy, Descriptive and Deductive:

By J. C. Boileau Grant, M. C., M. B., Ch. B., 4th ed., Baltimore, The Williams and Wilkins Co., 1948. pp. 852. Price \$7.00.

In the years following the first publication (1937) of "A Method of Anatomy" there have been three editions and nine reprintings. This is substantial evidence of the merit of the book. The present reviewer had the privilege of introducing the first edition to the readers of this Journal. It was characterized as "an innovation in the field of anatomical textbooks." Grant's text is no longer an innovation, for it has had a vigorous and useful existence through eleven years. However, it is still distinctive among the texts on anatomy for the features that made it so outstandingly different at the first: conciseness, subordination of anatomic trivia, clarity of statement and illustration, rational and stimulating approach. The fourth edition is a thoroughgoing revision, as the result of much rewriting; it contains 71 new figures.

HAROLD CUMMINS, Ph. D.

An Introduction to Surgery: By Rutherford Morrison, M. D., F. R. C. S. Edin., F. R. C. S. Eng., M. A., D. C. L., LL. D., and Charles F. M. Saint, C. B. E., M. D., M. S., F. R. C. S., F. R. A. C. S., 4th Ed., Baltimore, The Williams and Wilkins Co., 1948. pp. 330. Price \$10.00.

"An introduction to surgery" has been revised by Dr. Saint since the death of the senior author. As stated in the preface, this edition, as well as the previous ones, has as its object "to aid the student in thinking out for himself the problems

presented to him in the wards and in his textbooks."

This book differs somewhat from that of the usual textbook of elementary surgery both in subject matter and in the manner of presentation. Approximately the first one-third is devoted to a discussion of shock, wounds, infection, hemorrhage, and the effects of the interference of blood supply to tissues. The next one-third is a discourse on syphilis, tuberculosis, and malignant disease. The remainder of the book consists of a number of miscellaneous chapters which include discussions of the hollow muscular systems, the serous cavities, natural cures, and pathological conditions illustrating the application of surgical principles. The emphasis throughout is on general principles of surgery, and an attempt is made to give the reader an understanding of the basic pathophysiologic problems encountered in surgery rather than to present information on specific disease processes.

Many subjects are covered in a semioutline form, with important points in italics. The book is short, easy to read, and there are numerous illustrations.

G. L. JORDAN, M. D.

PUBLICATIONS RECEIVED

W. B. Saunders Company, Philadelphia: Current Therapy 1949, Howard F. Conn, M. D., editor. Atlas of Peripheral Nerve Injuries, by William R. Lyons, Ph. D. and Barnes Woodhall, M. D. Practical Aspects of Thyroid Diseases, by George Crile, Jr., M. D., F. A. C. S.

Paul B. Hoeber, Inc., New York: Neoplasms of Bone and Related Conditions, by Bradley L. Coley, M. D.

Charles C. Thomas, Springfield, Ill.: Neuroradiology, by Alexander Orley, M. D., F. F. R., D. M. R. & E. On the Contributions of Hugh Owen Thomas, Sir Robert Jones, John Ridlon, M. D. to Modern Orthopedic Surgery, by H. Winnett Orr, M. D. Posttraumatic Epilepsy, by A. Earl Walker, M. D.

The C. V. Mosby Company, St. Louis: British Surgical Practice, (Vol. 4), under the general editorship of Sir Ernest Rock Carling, F. R. C. S., F. R. C. P. and J. Paterson Ross, M. S., F. R. C. S. Handbook of Diseases of the Skin, by Richard L. Sutton, M. D. and Richard L. Sutton, Jr., M. D. Neurological and Neurosurgical Nursing, by C. G. de Gutierrez-Mahoney, M. D. and Esta Carini, R. N., B. S. Operating Room Technique, by Edythe Louise Alexander, R. N. (Second Edition).

Ventnor Publishers, Inc., Ventnor: Aesculapius Comes to the Colonies, by Maurice Bear Gordon, M. D.

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DECORTICATION OF THE LUNG

WALTER W. McCOOK, M. D.

SHREVEPORT

INTRODUCTION

Pulmonary decortication consists of the removal of an organizing or organized fibrous membrane from the visceral pleura. Its purpose is to allow immediate expansion of an unexpandable or slowly expandable lung by removing the constricting membrane or peel. This allows the lung to expand and fill the pleural cavity. It is thus the opposite of thoracoplasty which allows the chest wall to fall in and approximate the lung. It is a physiologically sound operation as it allows normal lung to fill the pleural cavity, obliterating dead space, and avoiding the lowering of pulmonary function and deformities of thoracoplasty.

Fowler¹ in 1893 first performed this operation. Delorme¹ reported on the procedure in 1894, and in 1896 gave it its present name. In succeeding years modifications have been frequent. Ransohoff¹ introduced discission, and numerous individuals combined partial decortication with collapsing operations of the Schede or Estlander types. Lilienthal¹ in 1915 reported on an extensive series of acute and chronic empyema treated by decortication.

All of these operations differed in at least two important respects as compared to the operations done today. Decortication was usually partial, no effort being made to free the lung completely up to the hilum and

pulmonary ligament. This is easily understandable as an effort to prevent opening up fresh areas for the spread of infection. Possibly the availability of modern chemotherapeutic and antibiotic agents has made us bolder in this respect, but it has been proved that total pulmonary decortication in the presence of pleural infection may be successfully carried out without use of these agents. It will be pointed out later that complete freeing of the lung and its fissures is one of the most important details necessary to assure a satisfactory result. The second difference is that until recently the operation ended up with open drainage or packing of the pleural cavity with consequent slow expansion of the lung and subsequent chest wall deformity, residual empyema, and incomplete expansion. Numerous operative procedures were necessary in the majority of cases before the pleural space could be obliterated. We now realize that rapid expansion of the lung with adherence to the chest wall and obliteration of the pleural cavity is the goal to be sought.

The generally unsatisfactory results, the numerous operative procedures necessary and the high operative mortality gradually caused decortication to fall into disuse. Its revival may be attributed to advances in surgery, particularly thoracic surgery, improved anesthesia, improved preoperative and postoperative care, availability of effective chemo and antibiotic therapy, and the stimulus of numerous thoracic casualties during the late war.

In May 1943, Burford² performed the first modern type decortication on a patient

*Read before the Sixty-eighth Annual Meeting of the Louisiana State Medical Society, Monroe, April, 1948.

with clotted hemothorax. Samson and Burford¹ estimated in 1946 that at least 1,500 early decortications had been done with a mortality of less than 2 per cent. Since this time a large number of reports have been added to the literature.

PATHOLOGY

An understanding of the pathology of the membrane or "peel" which encases the collapsed lung is essential for there is a true pathologic basis for the employment of decortication in indicated cases. Unfortunately the term "thickened pleura" has been handed down for years to describe this condition although many of the older writers recognized correctly the pathology present.

Any substance which occupies the pleural cavity and causes collapse of the lung may initiate the formation of an organized membrane on the pleural surfaces. We have seen this occur due to the presence within the pleural cavity of blood, pus, bile, and even air present over a long period of time. The deposition of fibrin on the pleural surface, the initial phase of formation of the "peel", may thus be due to settling of fibrin out of blood or pus or, we think, to the irritative effect of the intrapleural substance on the pleura causing an exudative pleuritis. If the lung is not allowed to expand this fibrinous pleuritis would then organize and form the "peel" holding the lung in a collapsed condition. In no other way can the occurrence of this condition in bile pleuritis, chronic pneumothorax, or long standing pleural effusion be explained. The formation of the membrane or "peel" certainly appears to be an inflammatory reaction although the amount of inflammation varies considerably in various conditions. Certainly, some of the thickest membranes we have found have been in cases of bile pleuritis, often coming on late, and due to the continuous leakage of bile into the pleural cavity. The continuous accumulation of bile prevents expansion of the lung and the irritative effect of bile on the pleura causes an exudative pleuritis which undergoes organization. It may well be that nonexpansion of a lung due to air leakage into the pleural cavity, atelectasis,

or lung hematoma is of more importance in the formation of a "clotted hemothorax" than actual blood clotting. This would explain the etiology of those cases coming on after early thoracotomy and evacuation of the pleural cavity. A recent case, not included here, of pneumohemothorax following a gun shot wound substantiates this theory. The blood was easily aspirated, but the pneumothorax continued due to bronchopleural fistula. For a week, or more, the blood was kept removed, then the chest began to fill up, and a typical picture of clotted hemothorax occurred. This was certainly due to exudation into the pleural cavity. It is probable that the only influence of the pleural clot is to prevent aspiration, and thus lung expansion, and to cause increased exudation over absorption. Animal experiments using defibrinated blood, bile and other irritants in the pleural cavity would probably settle the pathogenesis of the above condition. Langston and Tuttle³ have recently advanced this hypothesis for the explanation of chronic traumatic hemothorax.

Grossly the intrapleural mass consists of a membrane covering both visceral and parietal pleura and continuous from one to the other. Its thickness varies considerably depending upon age and etiology. It is usually thinnest in uncomplicated clotted hemothorax and thickest in chronic empyema. It is thickest in areas where the visceral and parietal elements merge. It usually extends into adjacent fissures and into the costophrenic gutters causing fixation and elevation of the diaphragm. The unoccupied pleural cavity is usually obliterated by flimsy adhesions. The peel itself is a membrane consisting of organizing fibrous tissue of varying density in different cases, closely adherent to the pleura from which it may be stripped. Towards the cavity the peel becomes less and less organized and its inner aspect is covered with fibrin. The center of the mass consists of fluid and fibrin and is often loculated. The color of the peel and the contents of the cavity vary considerably depending upon the etiology. The greatest mass occurs posteriorly as the

result of the position of the patient in bed. When the cavity is entered and all fluid and fibrin evacuated one sees a smooth walled cavity which obliterates all underlying landmarks.

Microscopically the appearance of the "peel" varies considerably with its age and the agent producing it. It appears to be essentially the progressive organization of a layer of fibrin or fibrinous exudate covering the pleural surfaces. The organization begins next to the pleural surface, and therefore, is more mature in this area. Towards the center of the cavity the organization becomes progressively less, and the inner layer consists of fibrinous exudate containing varying amounts of leucocytes depending on whether or not infection is present. In fairly recent cases capillaries are seen in the layer closest to the pleura while in old cases fair sized arteries and veins may be noted. In old cases dense fibrous septa may be seen extending into the underlying lung. Organization seems to be a continuous process probably stopping only when the denseness of the membrane prevents further exudation into the cavity or when the entire mass is organized.

It is to be emphasized that the organization occurs on the surface of the pleura. Samson and Burford¹ state that elastic fibers are never found in the peel but are regularly found in sections taken so as to contain pleura.

THE OPERATION

Preoperative care is essentially the same as for any major surgical procedure and will not be given in detail here. Penicillin is administered preoperatively if there is any suspicion of infection, and sufficient blood is made available—usually 1,000 to 2,000 cc. Preliminary drainage of the pleural cavity may be necessary in very ill patients, and preoperative postural drainage or bronchoscopy, or both are used in patients with bronchopleural fistula.

Intratracheal positive pressure ether-oxygen or cyclopropane has been used in all cases. Controlled respiration has been used in some of the cases and gives a quiet field in which to work.

The patient is placed on his side with

the operative site upwards and a canula is placed in an ankle vein before the incision is made. Blood is given continuously during the procedure.

A posteriolateral incision is made and the cavity is entered through the bed of the resected seventh rib. A rib above and below this site may be chosen occasionally, depending on where the major difficulty is anticipated. We feel that rib resection gives a little more room and provides a better closure.

After opening into the cavity, fluid and clots are evacuated and loculations broken up. It is important to free the costal part of the peel for some distance above and below the incision before the ribs are spread, otherwise the lung may be torn severely. This is done in the extrapleural space, no effort being made to spare the parietal pleura. After the rib spreader is inserted the cavity is further cleansed of all debris, and a smooth walled cavity obliterating all underlying landmarks is seen. A transverse incision is carefully made with the knife through the peel overlying the lower lobe. This is carefully deepened until underlying lung covered with pleura herniates through. The cut edges of the peel are then grasped with forceps and it is dissected off the lung mainly by blunt dissection with the fingers and small gauze dissectors. It is occasionally necessary to use sharp dissection, especially at the fissures, at the reflection of the peel onto the chest wall, and on the diaphragm. It is important to try to remove it intact or at least in large pieces as it is easier to keep in the cleavage plane in this way. If the visceral pleura or lung is torn, this area is abandoned temporarily and dissection restarted in another area. While minor lung tears are almost impossible to prevent in old cases, especially in empyema, they should be kept to a minimum as the air leakage thus caused may prevent rapid lung expansion.

The peel is carefully removed from the lung and all involved fissures are carefully dissected free. Beyond the reflection of the peel onto the chest wall the pleural cavity is usually obliterated by flimsy adhesions,

and dissection may proceed rapidly. It is important to completely free the lung from the chest wall, mediastinum, and diaphragm up to the hilum and pulmonary ligament so that expansion will be rapid and normal relations restored.

At this point the lung is carefully inspected and any other procedure such as suture, wedge resection, or segmental lobectomy carried out.

It is important that several times during the procedure after the lung is freed, it be slowly expanded under positive pressure and atelectatic areas gently massaged.

Attention is then turned to the chest wall. While most authors have advocated not decorticating the chest wall, we have felt that it adds little to the operation and removes a source of scar tissue that might cause chest wall deformity and fixation. The costal peel is removed along with the parietal pleura, dissection being carried out in the extrapleural plane. This is rapidly and easily done and causes remarkably little bleeding. The diaphragm is then decorticated and its sinuses freed up as well as is possible.

The pleural cavity is irrigated with saline and air leaks sought. Large ones, if present are sutured, small ones disregarded.

Two large soft rubber tubes or catheters with multiple perforations are placed into the pleural cavity through stab wounds, one in the eighth or ninth interspace in the posterior axillary line and another in the second or third interspace in the mid-clavicular line. These are connected through a "Y" tube to an underwater seal. The lung is expanded and the chest wall closed in layers with interrupted cotton sutures.

We have given penicillin intrapleurally in some cases, but not in all, and do not think it very useful as we use drainage immediately after operation, believing that rapid lung expansion is the most important element in preventing infection. Besides, the constant ooze of blood and serum should contain a bacteriostatic concentration of penicillin.

Postoperatively it is most important that the drainage tubes be properly cared for.

These are milked at regular intervals. We have not used suction, finding that the negative pressure obtained by the use of an underwater seal is sufficient. The tubes are removed as soon as they cease draining, usually between twenty-four to forty-eight hours. After they cease draining they serve no useful function and act as an intrapleural foreign body. We have not irrigated the drainage tubes. Penicillin is continued postoperatively.

The patient is mobilized early, usually being out of bed the first postoperative day. He is urged to cough, and perform breathing and arm exercises. He should receive sedatives enough to allay pain, but not enough to suppress the cough reflex. Manual support during coughing is helpful and if pain is severe intercostal block may be done.

Lung expansion is followed closely. If breath sounds come through clearly and the tubes have stopped draining one can be fairly certain that expansion is adequate. The patient is sent to the x-ray department for desired roentgenograms, as portable films are not very satisfactory. A regular diet is allowed as soon as nausea subsides. Sutures are usually removed on the fifth or sixth day.

Complications have been infrequent. Atelectasis has been treated by voluntary coughing or tracheal aspiration, although if severe and unrelieved, bronchoscopy would be indicated. Occasionally a postoperative thoracentesis is indicated, and we have done rib resections for drainage of a small residual pocket resulting from the subdiaphragmatic drain accidentally having come out after a decortication for bile empyema. One patient who had a decortication and segmental lobectomy for amebic pleuritis with bronchopleural fistula did not expand completely and still has a fluid filled pocket in his pleural cavity, although his bronchopleural fistula remained closed. He will probably need redecoration.

There have been no wound infections.

INDICATIONS FOR DECORTICATION

Langston¹ has pointed out that, given an intact chest wall, there are three factors

that prevent pulmonary expansion. These are:

1. Bronchial, as in atelectasis.
2. Pulmonary, as in massive fibrosis.
3. Pleural
 - a) Presence within the pleural cavity of air, pus, bile, blood, etc.
 - b) Constricting pleural investments or membranes.

While all the above factors are of importance in differential diagnosis and may be important in etiology, it is only in nonexpansion due to constricting pleural investments or membranes that decortication is indicated.

The following conditions may, because of inadequate, or even in spite of early adequate treatment, give rise to an unexpanded lung because of constricting membranes and thus become candidates for decortication:

1. Organizing or organized hemothorax
 - a) Uninfected
 - b) Infected
2. Empyema
 - a) Pyogenic
 - b) Bile
 - c) Tuberculous
 - d) Miscellaneous
3. Chronic pneumothorax
4. Organized pleural effusions

Contraindications to decortication in the above conditions would be unrelieved bronchial obstruction, massive pulmonary fibrosis, and fear of exacerbating an underlying lung infection by re-expansion.

ORGANIZING OR ORGANIZED HEMOTHORAX

More decortications have been done for this condition than for all others combined and, as has been pointed out, this served as a major stimulus for revival of the procedure. Large series of cases have been reported by Burford, Parker, and Sampson,³ Tuttle, Langston and Crowley,² and others.

Patients with organizing hemothorax are observed and repeated aspirations attempted for a period of three weeks. If, at the end of this time progressive resolution is not taking place, and it is felt from clinical and x-ray studies that impairment of pul-

monary function and chest wall deformity will occur, decortication is carried out.

Sampson and Burford¹ carry out decortication at the end of four to six weeks if the patient presents all or part of the following criteria.

1. Roentgenographic evidence of a generally hazy chest.
2. Lateral pulmonary compression of 50 per cent or more with a collapsed apex.
3. Poor thoracic expansion with retraction and narrowing of interspaces.
4. Diffuse thoracic pain or discomfort.
5. Dyspnea on exertion.

The period of observation and repeated aspiration is carried out because many will clear sufficiently in this time and also because the peel is technically easier to remove after a lapse of time as it becomes tougher and strips more readily.

If infection of the hemothorax occurs decortication is carried out earlier as the peel organizes rapidly. Infection does not basically alter treatment and one may be surprised at times to find pus present in clinically uninfected cases.

The following case is presented as a typical result following decortication for organizing hemothorax.

B. F., colored male, was admitted December 1, 1946, with a diagnosis of clotted hemothorax. He had suffered a gun shot wound of his right chest with fracture of his fifth rib on November 23. Decortication was carried out on December 16, and he was discharged on December 22, afebrile and lung expanded. (Fig. I, a & b).

EMPHYEMA

Decortication for empyema is somewhat of a new concept as it converts what is usually a partial empyema into a total empyema and then obliterates the pleural cavity by rapid lung expansion. It is not indicated in those cases which will respond readily to less radical measures. It is indicated in those cases in which it is felt, by history, examination and x-ray studies, that full expansion will not occur. It is also indicated in cases in which expansion will be so slow that marked chest wall deformity and fixation will occur. Very ill and toxic patients or those with significant acute lung pathology may be prepared for



Figure 1a. Preoperative



Figure 1b. Postoperative

decortication by open drainage. Aspiration and injection of penicillin may also be of value preoperatively and may even sterilize the cavity. Sanger⁶ and Curreri and Gale⁷ have recently reported cases of acute and chronic empyema treated by decortication.

R. H., 5 year old white male, was admitted May 5, 1947, with a diagnosis of lobar pneumonia of the right lower lobe. He was started on penicillin on admission. Subsequent examination revealed a massive empyema with collapse of the lung. Numerous aspirations and injections of penicillin sterilized the cavity but the lung showed no tendency to expand. Decortication was carried out on June 19. The lung fully expanded within twenty-four hours. He was discharged July 19, with a fully expanded lung. (Fig. 2 a & b).

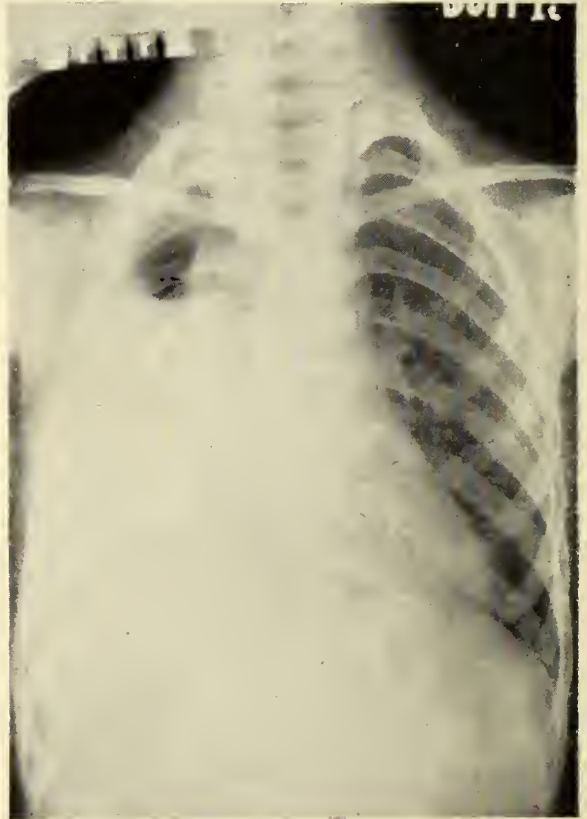


Figure 2a. Preoperative

BILE EMPYEMA

Bile empyemas, while infrequently reported in the literature, were relatively frequent in thoracic centers during the war according to Shaw⁸. Guy and Oleck⁹ recently could find only six reported cases of traumatic biliary-bronchial fistula, includ-

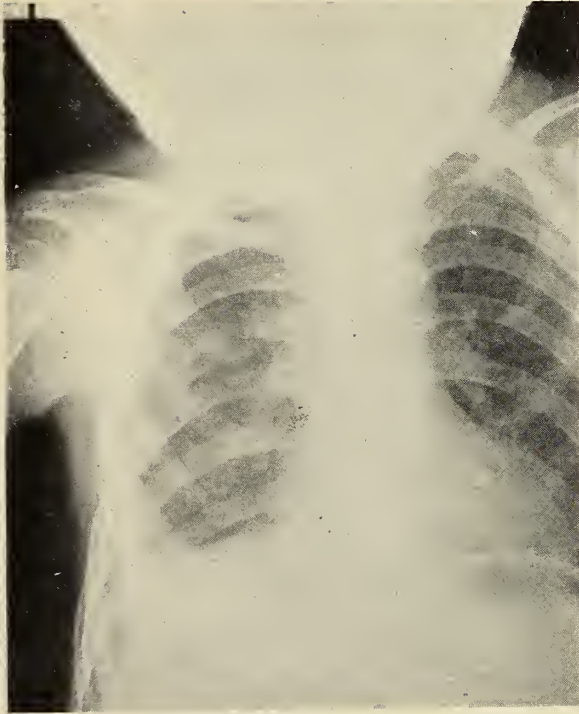


Figure 2b. Postoperative

ing two of their own, but I believe they are much more frequent than reports indicate. Bile empyema presents the same indications for decortication as other conditions causing unexpandable lung because of constricting membranes. The only difference in treatment is that the diaphragmatic opening must be closed and provision made for prolonged subdiaphragmatic drainage of bile.

M. G., 35 year old colored male, was admitted March 16, 1946, with a recent gun shot wound of the lower right chest. Because of abdominal rigidity exploratory laparotomy was performed, with negative findings. Postoperatively he showed signs of fluid in his right chest and multiple aspirations were carried out. These did not succeed in emptying the pleural cavity and x-ray showed massive collapse of the right lung with loculated fluid in the pleural cavity. Decortication was done on April 4, the opening in the diaphragm closed, and subdiaphragmatic drainage established through the costophrenic sinus. Postoperatively the lung expanded immediately but a small residual pocket of bile occurred following the accidental coming out of the subdiaphragmatic drain. This was treated by resection of a segment of the tenth rib with open

drainage on April 18, and on June 25 he was discharged afebrile and with a fully expanded lung and a healed chest wall. (Fig. 3 a & b).

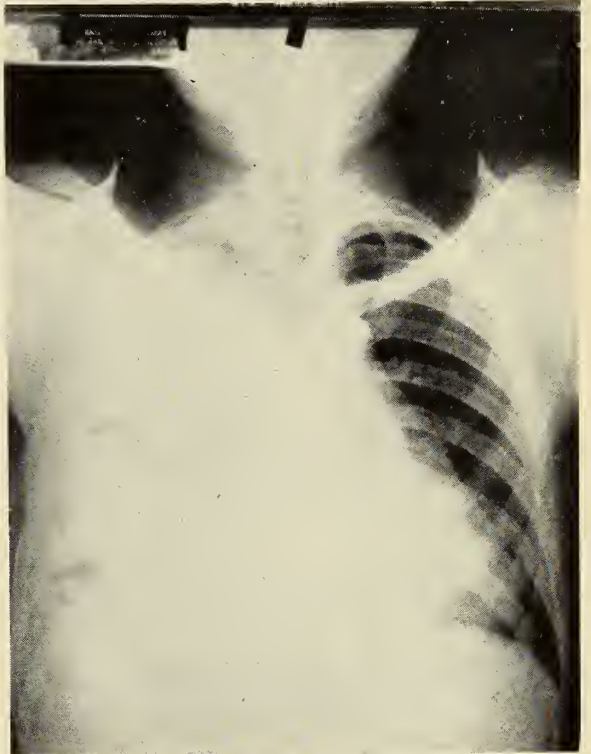


Figure 3a. Preoperative

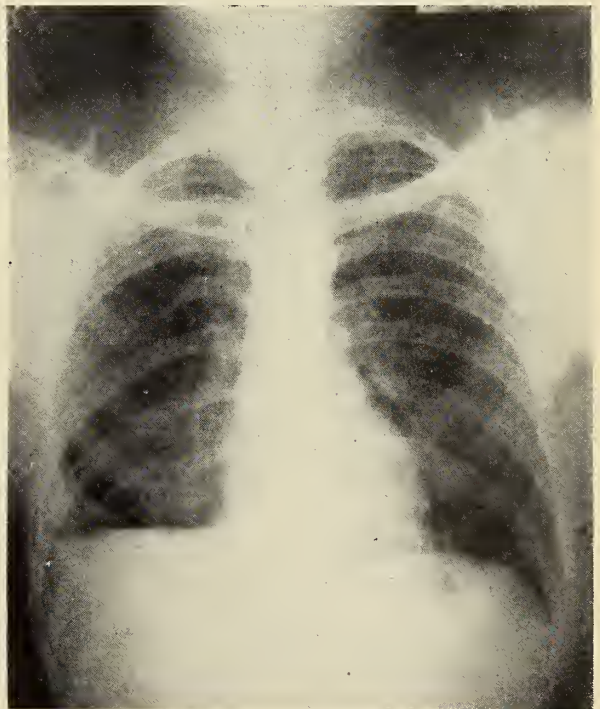


Figure 3b. Postoperative

TUBERCULOUS EMPYEMA

Tuberculous empyema offers the greatest challenge to decortication. Sporadic cases have been reported and recently Gurd¹⁰ and Lam¹¹ have each reported several cases. It is likely that it will be very useful in cases without underlying lung pathology and, combined with thoracoplasty in cases in which the tuberculous pulmonary lesion is limited to the upper lobe. This would prevent reactivation of the lesion, obliterate the empyema cavity, and preserve the function of the lower lobe. I have no personal experience with decortication in tuberculous empyema.

ORGANIZED PLEURAL EFFUSIONS AND CHRONIC PNEUMOTHORAX

I have not performed decortication for either of these conditions. Paulson¹² states that he has carried out the procedure in several cases of organized pleural effusion and a recent case of chronic pneumothorax seen at autopsy demonstrated the feasibility of decortication for this condition. The indications would seem to be clear and the treatment identical to that of constricting membranes caused by other agents.

SUMMARY

Pulmonary decortication is indicated in a variety of conditions which cause an unexpandable lung because of constricting pleural investments.

It is a physiologically sound operation which obliterates pleural dead space, preserves lung function and minimizes chest wall fixation and deformity.

An hypothesis is presented which explains the pathogenesis of unexpandable lung because of constricting pleural investments caused by a large variety of etiologic agents.

The operative technic and preoperative and postoperative care are discussed and a plea made for decortication of the chest wall.

Indications are discussed and representative cases reported.

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DISCUSSION

Dr. L. H. Strug (New Orleans): Dr. McCook is to be congratulated on his excellent presentation of the subject of pulmonary decortication. His fine work has certainly prevented many individuals from becoming chronic pulmonary cripples. I was most fortunate in being present in the Mediterranean theater during the recent war, when Sampson and Burford made their important contribution. Their initial effort, plus subsequent contributions by many others, was responsible for the popularization of pulmonary decortication in both clotted and infected hemothoraces and the procedure lately has been extended once more to the treatment of acute and chronic empyema.

The procedure of pulmonary decortication is an old one as has been shown by Dr. McCook. It was originally devised for the treatment of chronic empyema. Prior to the recent world war, the procedure was a most difficult one and was attendant with a high morbidity and mortality and thus had largely been abandoned. That this procedure could be successfully performed in the earlier days was ably demonstrated by Lilienthal, who in 1915 reported 23 cases of decortication of the lung for empyema with a mortality of only 17 per cent. This was phenomenal in its day. Hedbloom, in 1920, also reported many successful results. However, by far and large the results were unsuccessful.

Sampson and Burford reasoned that the difference in failure at that time and success now was due to several factors, namely: (1) anesthesia, (2) antibiotics, (3) timing of the decortication, (4) adequate preoperative and postoperative care.

When should a pulmonary decortication be performed? The difficulties encountered when the processes of clotted hemothorax or chronic empyema were allowed to go on for some time were amply demonstrated by numerous clinical investigators. This is due to increasing fibrosis of the exudate covering the visceral pleura which infiltrates into the lung proper as the process ages. This pathologic process was demonstrated by Graham in his

treatise on empyema. Realizing this fact, both Sampson and Burford by trial and error arrived at what they considered an optimal time for pulmonary decortication. The time eventually chosen was between four and seven weeks following the onset of the clotted hemothorax, and somewhat earlier in infected hemothorax.

On the Louisiana State University Surgical Service at Charity Hospital in New Orleans 17 pulmonary decortications were performed during 1946-47. Two additional cases were performed recently but have not been added to this statistical study, which I will briefly mention. Of the 17 cases, 3 were performed for clotted hemothorax and 14 for empyema. The age group in the empyemas varied from 3 months to 46 years. The results upon discharge from the hospital were classified as excellent in 14, good in 2, and poor in 1. A bad result was one in which a subdiaphragmatic abscess ruptured into the pleural cavity, although the opening into the diaphragm was closed at the time of decortication, a point which was emphasized by Dr. McCook. Adequate drainage below the diaphragm was not performed at that time. This necessitated additional surgery later, both in the chest and abdomen.

DISSEMINATED COCCIDIOIDOMYCOSIS

REPORT OF A CASE IN LOUISIANA*

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OZA J. LABARGE, M. D.†
ALEXANDRIA

Since the original report of a case of coccidioidal granuloma in the United States by Rixford and Gilchrist¹ in 1896, a large and voluminous literature has accumulated concerning the varying manifestations of this clinical syndrome. There is general agreement that the etiological factor, the *Coccidioides immitis*, is a native of the arid regions of the western and the southwestern United States and particularly of certain semidesert areas of California. It is natural, therefore, that the vast majority of the cases reported in the United States

have originated from these areas. The increasing ease of travel, especially by migratory workers, has resulted in a widening of exposure. In addition, during the recent war large numbers of troops were trained in the desert areas of the West and the Southwest and as a result of these two factors, the disease has become widely distributed throughout the entire country. Sporadic cases may be encountered in any community. The usual manifestation of infection from the clinical viewpoint is that of a relatively mild but somewhat prolonged pulmonary infection with eventual complete recovery. Jamison,² however, in a study of an extensive series of cases, found that from 10 to 15 per cent gradually developed chronicity without healing and recovery in the usual periods of time. Approximately 15 per cent of his cases in the chronic group finally evolved into fatal cases of systemic dissemination (probably through the blood stream). Two such cases have already been reported from Louisiana. The first was by McDonald³ in 1934 and the second by Schenken and Palik⁴ in 1942. The third is presented in this paper.

CHARACTERISTICS OF THE ORGANISM

The *Coccidioides immitis*, the etiological agent of coccidioidomycosis appears in the tissues of the infected host as a sporule with a double contoured thick hyaline capsule which varies from 5 to 80 micra in diameter.² Early in the development of the sporule only a granular type of cytoplasm can be seen. With increasing age the cytoplasm of each sporule groups itself into from 10 to 200 endospores. These endospores are released into the tissues of the host by the rupture of the mature sporule and the resulting tissue reaction is of the chronic granulomatous type. The microscopic picture is that of a sporule surrounded by epithelioid cells, giant cells, lymphocytes, and plasma cells with the formation of a tubercle-like structure. If secondary infection takes place there may be an additional infiltration of polymorphonuclear cells. The microscopic picture is typical and should not be mistaken for any other type of granulomatous lesion. On Sabouraud's media, the organism

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develops a profuse white creamy growth which in a period of from four to eighteen days assumes a brownish white cottony appearance. The growth is composed of interlacing mycelia and hyphae with chlamydospores. In culture, reproduction is by budding and possibly by mycelial fragmentation.⁵ McNeal and Taylor⁶ have reported endospore formation in anaerobic cultures.

CLINICAL FEATURES

Infection of the human host is almost invariably by the respiratory route. During the rainy season the fungus probably grows in the soil and on vegetation. Upon drying the chlamydospores break from the hyphae and are scattered by the wind. When inhaled into the respiratory tract sporulation, extension and reproduction by endosporulation result with the production of the typical granulomatous lesions. Evidence has been adduced to the effect that animals of the endemic areas may serve as reservoirs of infection.^{7, 8} In the majority of the clinical cases² the invasion is confined to the respiratory system with manifestations ranging from those of localized nodular pulmonary infections of short duration to those of a prolonged septic type of severe pneumonitis with marked prostration, high temperature, chest pain, hemoptysis, mediastinal lymphadenopathy, x-ray evidence of extensive pulmonary infiltration, and not infrequently ultimate death. Pleural effusion is a relatively rare complication.² A small minority of the total cases develop into the disseminated type with widespread involvement of almost every organ in the body as well as the lymph glands, muscles, and bones. In these latter cases, cachexia is severe; there are sustained fever, severe cough, elevated white blood counts, sharply increased sedimentation rates, anorexia, and dulling of the sensorium with mild delirium. Treatment in this type is of little avail and the mortality ranges from 90 per cent to 95 per cent.

CASE REPORT

J. B. S., 23 year old colored male veteran, native of Louisiana, was admitted to the Veterans Administration Hospital, Alexandria, Louisiana, on April 21, 1947, complaining of dyspnea, pain in the right chest, cough with marked blood streaked expectoration, night sweats, generalized malaise and weak-

ness. The admitting diagnosis was pulmonary tuberculosis. He had served in the U. S. Army from February 4, 1943, to January 26, 1946, with seven months of foreign duty in France and thirteen months in the Philippine Islands. At the time of discharge from the service (in California) he was entirely well. He worked as a fruit picker and handler in orchards around Bakersfield, California during February, March, April, May and June of 1946. During that period he contracted a persistent "cold" and returned to Louisiana in July 1946. He worked for varying periods of time in a lumber mill at Leesville, Louisiana, but the "cold" and cough persisted and he was never entirely free from it. Four weeks prior to admission to the hospital the cough became worse and he began to have profuse night sweats. He "lost his appetite" and could hardly eat anything. The cough was productive of a yellow phlegm. Four days later he noted a sharp stabbing pain in the right axillary region which was sharply increased on coughing and deep breathing. After about two days the pain in the right chest disappeared but he noticed steadily increasing dyspnea. From that time on his condition became progressively worse with constant high fever, dyspnea at rest, a severe cough with blood streaked sputum, marked anorexia, weakness and continuing weight loss. He consulted a private physician who made a tentative diagnosis of pulmonary tuberculosis and sent him to the hospital.

PHYSICAL EXAMINATION

Physical examination upon admission showed a well oriented, cooperative young colored male who was propped up in bed and uncomfortably dyspneic. He was emaciated, weak, and appeared chronically ill. His admission weight was 120 pounds (a loss of 40 pounds from his usual weight). The oral temperature was 101.8°F., pulse rate 140, and respiratory rate was 30. The right side of the chest was immobile with a flat percussion note, a diminished tactile fremitus and distant bronchial breathing. There was also definite bulging of the intercostal spaces of the right lower chest.

LABORATORY FINDINGS

The red blood count was 3,150,000, white blood count 12,500 with 75 per cent polys and 25 per cent lymphs. The hemoglobin was 9.75 grams. The sedimentation rate was 18 mm. per hour by the Wintrobe method. The urinalysis was normal and the blood Kahn reaction was negative. A roentgenogram of the chest showed a ground glass density of the entire right chest which was indicative of a pleural effusion. A thoracentesis of the right chest resulted in the recovery of 20 cc. of serosanguinous fluid which was negative for tubercle bacilli. Subsequent aspirations produced amounts of thick, greenish yellow purulent material ranging from 20 cc. to 300 cc. in quantity. Large numbers of sporules of *Coccidioides immitis* were evident in both smear and culture of the purulent material recovered at the second thoracentesis. The same

organism was subsequently recovered from the pleural fluid repeatedly. Repeated examinations of the sputum were negative for acid fast bacilli. About one month after admission to the hospital the patient developed large subcutaneous swellings over the right mandibular region, on the outer side of the right forearm below the elbow joint and over the lower portion of the calf of the right leg. These swellings were not acutely inflammatory or particularly painful and did not have the characteristics of acute abscess formation. X-ray examination of these areas was negative for either periosteal or bone involvement. Aspiration of each of these resulted in the recovery of a serosanguinous fluid and the sporules of *Coccidioides immitis* were recovered from all aspirated specimens by both smear and culture. On May 29, 1947, after repeated examinations, the sporules of *Coccidioides immitis* were also recovered from the sputum. A skin test for *Coccidioides immitis* performed on May 27, 1947, showed only a doubtful reaction.

COURSE

The clinical course of the patient was unfavorable. He maintained a constant elevation of temperature ranging from 101°F. to 105°F. The anemia became steadily more marked. Dyspnea was constant and he had severe night sweats, persistent anorexia, and increasing cachexia. Therapy with thymol (1 ounce twice a day) and saturated solution potassium iodide (20 minims three times a day) was of no apparent value. Coccidioidin could not be secured for an immunization program of therapy. From June 30, 1947 to July 21, 1947, patient was definitely stuporous and could be aroused only with difficulty. On July 21, he was practically comatose with a Cheyne-Stokes type of respiration. It was noted on July 23 that his eyes deviated to the right, his pupils were dilated and fixed and his neck muscles were rigid. Spinal puncture on that date showed a clear fluid under normal pressure with an increased number of lymphocytes but nothing else of note. The patient expired on July 24, 1947.

NECROPSY REPORT

Necropsy was performed two hours after death. The body was that of a young, very emaciated colored male. Fluctuant subcutaneous masses varying from 10 to 20 cm. in diameter were present over the right lower jaw, the upper portion of the right forearm and the lower portion of the calf of the right leg. These fluctuant areas contained an odorless, reddish pink, watery fluid from which cultures and smears were made. The meninges were cloudy. Over the brain surfaces there were many nodules of a firm, whitish character, 5 to 10 mm. in size. Sectioning of the brain revealed multiple abscesses in the cerebellum, pons and left lenticular nucleus 5 to 10 mm. in size. These contained a purulent exudate. The right pleural cavity was entirely filled with a greenish yellow thick fluid with an offensive fecal odor and the pleural cavity was lined with a thick layer of greenish yellow fibrinous tissue. The left pleural cavity was not

involved. The right lung weighed 75 gms. It was completely collapsed and fibrotic in character. The left lung weighed 275 gms. and was soft and crepitant. However, many multiple gray pinpoint nodules were diffusely scattered throughout the parenchyma of the left lung. The mediastinal lymph nodes were slightly enlarged, friable, and greyish white on section, with evident areas of necrosis. Grossly, the heart was entirely normal. The liver was of medium size with a weight of 1900 gms. and on section multiple small white nodules were found to be diffusely distributed throughout the liver tissue. The spleen was normal in size and apparently uninvolved. The combined weight of both kidneys was 300 gms. The capsule of each kidney stripped readily revealing a pale yellowish brown smooth cortical surface. Sections of each kidney disclosed multiple yellowish white nodules 5 to 10 mm. with necrotic centers. Similar nodules were found in each adrenal gland. The pancreas was not grossly abnormal. No other findings of pathological interest were found in the abdomen.

Bacteriologically, fresh smears and cultures from the involved areas of the brain, both lungs, the liver, the kidneys, the adrenal glands, and from the abscesses of the subcutaneous tissues previously described revealed numerous double refractile bodies 20 to 40 micra in diameter and filled with endospores. These bodies were morphologically identifiable as the sporules of *Coccidioides immitis*.

Sections of tissue from the meninges, brain, lungs, mediastinal lymph nodes, liver, adrenal glands, kidneys, and the areas of subcutaneous swelling noted were prepared with hematoxylin-eosin stain. These revealed granulomatous areas of a tubercle-like character consisting of a central zone of necrotic cellular debris, lymphocytes and polymorphonuclear leukocytes. Surrounding this central zone was a layer of fibrous-like tissue containing epithelioid cells, and about this layer was a zone of circularly arranged fibrous tissue containing many lymphocytes. Scattered throughout the entire tubercle-like mass were many double-refractile bodies 20 to 40 micra in diameter containing either a pale purple homogenous pigment or purplish black endospores. These double refractile bodies were found both free and within large giant cells of the Langhans type and were identified as the sporules of *Coccidioides immitis*.

DISCUSSION

From the clear cut history in this case, it is highly probable that the patient contracted his infection while working as a fruit handler near Bakersfield, California, in the spring of 1946. Following his initial infection there was a long period of many months when apparently the involvement was confined to the tracheobronchial lymph nodes and the pulmonary tissues. The acute

phase of his clinical condition became evident with the involvement of the right pleural space either as the result of direct extension from the right lung through the visceral pleura or by involvement of the right pleural space either by a lymphogenous or a hematogenous spread. It is noteworthy that the first fluid recovered from the right pleural cavity was serosanguinous in type and that the same type of fluid was also found in the subcutaneous areas of involvement. The subsequent development of frank pus in the right pleural cavity was undoubtedly due to secondary infection either from a subpleural abscess of the lung itself or of external origin. Within a short period of time after the right pleural involvement became evident the patient developed a widespread disseminated type of coccidioidal infection in such diverse tissues as the brain, lungs, liver, spleen, adrenal glands, kidneys, and the subcutaneous tissues. This dissemination was in all probability by way of the blood stream although it is noteworthy that no evidence of pathology could be found in the heart itself. The morphological development of the lesions quite evidently consisted first of multiple tubercle formation followed by coalescence of these tubercles and necrosis of the areas involved with abscess formation. These findings were particularly notable in the brain, the tracheobronchial lymph nodes, the adrenal glands and the kidneys.

It is interesting to note that our patient was of the Negro race. Jamison² has pointed out that Negroes, Mexicans, and Filipinos show a greater tendency to dissemination of coccidioidal infections than white patients and he has expressed the opinion that dissemination is at least one hundred times more common in Negro than in white patients. Also the patient had a right pleural involvement as well as an extensive meningeal and brain involvement. Both of these complications are relatively rare.

Although a large amount of information has been collected concerning fungus infections in general and, with improved diag-

nostic methods, diagnoses of fungus infections particularly of the respiratory tract are being made with increasing frequency, the treatment of these conditions in general is far from satisfactory. The usually recommended treatment with thymol and potassium iodide was of no value in this case and in all probability is of little value in any case of fungus infection. Despite strenuous efforts to do so, we were unable to secure any coccidioidin for an attempt at the immunization method of therapy.

The importance of an adequate clinical history is emphasized by developments in this patient. During the recent war many thousands of soldiers received training in desert areas in which infection with *Coccidioides immitis* is endemic and these thousands of military personnel are now scattered over the entire United States. In addition, itinerant workers as well as tourists may also contract the disease as is demonstrated by this case. It is fortunate that the great majority of such infections are of a relatively mild character, confined solely to the respiratory tract and heal without specific treatment because of the self-sufficient resistance of the host. Certainly, at present, clinical medicine has little to offer these patients in the way of any specific treatment.

SUMMARY

1. The third case of widely disseminated infection with *Coccidioides immitis* occurring in Louisiana is presented. The patient was a young Negro male veteran. This case terminated fatally despite clinically adequate therapy with the usually recommended methods. The postmortem findings are described in detail.

2. The patient probably contracted the infection while working as a fruit picker and handler in an endemic region of California. The disease was apparently confined entirely to the respiratory tract for a period of more than a year. A period of relative quiescence was followed by right pleural involvement, widespread dissemination, and death.

3. The value of a good clinical and environmental history is emphasized. The treatment of such infections is discussed briefly.

4. The admitting diagnosis was pulmonary tuberculosis. Fungus infections particularly of the respiratory tract must always be considered in the differential diagnosis of chronic pulmonary lesions.

5. Racial factors may be responsible for the high tendency to widespread dissemination with resulting relatively high mortality occurring in cases of *Coccidioides immitis* in the Negro.

6. Because of the frequency and extent of travel as well as the fact that many thousands of military personnel were trained in endemic areas during the recent war, clinical cases of infection with *Coccidioides immitis* may be encountered in the practice of any physician anywhere in the United States. Physicians in general must be alert to this possibility.

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REFLEX SYMPATHETIC DYSTROPHY

SHEA HALLE, M. D.*

NEW ORLEANS

A wartime experience prompted Weir Mitchell¹³ and his associates to publish in 1864 a dramatic account of a syndrome which he referred to as causalgia. Intractable and tormenting pain was the striking feature of this illness, and accompanying it were definite signs of nerve dysfunction as evidenced by marked trophic and vasomotor disturbances. To Mitchell, causalgia

was the result of peripheral nerve injury. More recently, reports have appeared of cases similar in many respects but with varied etiology. In these a heterogeneous array of names have been applied, among which are the following:^{3, 5, 7, 8, 10, 12}

1. Causalgia
2. Minor Causalgia
3. Reflex Arterial Spasm
4. Reflex Dystrophy of the Extremities
5. Trophic Edema
6. Traumatic Osteoporosis
7. Sudeck's Atrophy
8. Post-Traumatic Painful Osteoporosis
9. Peripheral Acute Trophoneurosis
10. Chronic Traumatic Edema
11. Reflex Sympathetic Dystrophy
12. Phantom Limb Pain
13. Shoulder-Hand Dystrophy

These names indicate that they all refer to the outstanding manifestation of a pathologic process which, as will be shown, is common to all.

What then links these apparently different entities? Common to all is a precipitating trauma or inflammation, varying from a gunshot wound of nerve, as in Weir Mitchell's cases, to a simple sprain, a burn, an injection of drug, or a thrombophlebitis. A superficial glance at the entities cited reveals a wealth of apparently dissimilar manifestations, but this is essentially a quantitative difference. Pain is present in nearly all cases, but varies from an excruciating severity to a mild ache. A peculiar osteoporosis¹⁸ (Sudeck's osteoporosis) is common to most, also varying from a negligible degree, not visible roentgenologically, to extensive involvement. Vasomotor changes may appear to be opposites but are proportional to the tone of the peripheral vessels. Thus, if vasoconstriction predominates, there is a cold, pale, sweaty, glossy skin; if vasodilatation, there is a dry, warm, red skin. Other trophic and vasomotor changes correlate well with the underlying degree of vascular tonicity. These findings indicate a common denominator for the superficially dissimilar manifestations: dysfunction of the autonomic nervous system. The burning pain, the

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vasoconstriction, or vasodilatation, and resulting trophic changes, all represent an altered state of the autonomic nervous system. Since sympathetic surgery has given marked improvement, the tendency has been to place the fault entirely on altered sympathetic function, but there is no real proof that the parasympathetics are not involved.

Mechanisms attempting to explain all these observations are numerous. There is some agreement that an initiating trauma sets up a nidus which reflexly discharges stimuli through the sympathetics or parasympathetics, with resultant dysfunction. This concept of a reflex mechanism with secondary dystrophic changes, referred to as reflex sympathetic dystrophy, is widely accepted at present as one that encompasses all the entities named.

PREDISPOSING CONDITIONS

Many diseases have been thought to be the precipitating factor in reflex sympathetic dystrophy, with four main subdivisions ordinarily used. Common to all are trauma or inflammation, in the broad pathologic sense.^{1, 3, 6, 12, 13, 16, 18, 21}

1. *Infectious Inflammatory.* Gonorrheal arthritis, tuberculous arthritis, felon, cellulitis of tendon sheaths, inflammation of soft parts, freezing and burning injuries, immersion injuries, osteomyelitis, subdeltoid bursitis, periarthrititis (Rheumatoid arthritis?).

2. *Neuritic.* Peripheral neuritis (alcoholic, toxic), Guillian Barre syndrome, gunshot wound of nerves (partial, especially median, tibial, sciatic, ulnar, radial and peroneal). Angina? Raynauds?

3. *Thrombotic.* Thrombophlebitis, thromboarteritis, arteritis, Buerger's disease.

4. *Acute Traumatic.* Fracture (especially near joints), luxation, torn ligament, sprain, direct blow, hematoma, traumatic synovitis, bismuth (and other drug) injection near veins, nerves or arteries.

In all of these there is some disturbance which may serve as an initiating nidus or stimulus for the discharging of nervous impulses in a reflex manner. Many such lesions involve inflammation of nerve, peri-

vascular and periarthritic tissue, the usual explanation being that trauma or disturbance of nerves or blood vessels (with their heavy perivascular nerve supply), or periarticular structures (where nerve endings are also particularly plentiful), has a greater chance of starting the abnormal reflex mechanism. In the next few years other clinical syndromes undoubtedly will be found to have reflex sympathetic dystrophy contributing a large part to their picture.

SIGNS AND SYMPTOMS

The clinical features presented by these patients vary, as might be expected, depending upon the phase of autonomic imbalance predominating.

Mitchell¹³ described most of his cases as having a burning pain, agonizing in nature, as the earliest complaint. Other descriptions of the pain are "burning", "red-hot file rasping the skin", and "mustard red hot". These patients may develop elaborate rituals to protect the injured part, such as using wet rags. They behave like the classic douloureux patient who cannot tolerate even a whisp of wind or sudden noise because such disturbances aggravate the pain. These, however, are the extremes of pain, and are found in cases described as causalgia. In minor causalgia or post-traumatic painful osteoporosis the pain is much less severe.

The distribution of pain is often bizarre. It may follow a classical nerve distribution, especially if the underlying lesion is a peripheral nerve injury. Frequently, however, there is no characteristic neurologic distribution. If it does not follow the segmental distribution of peripheral nerves, the cause is probably stimulation of periarterial, perivenous, or other nerve plexuses which are supplied to the vessels in a segmental pattern, and which synapse with radicular elements going to a distant skin area. In general, causalgic pain is most common in the palms of the hands and dorsum of the feet. When peripheral nerves are injured the pain usually follows the nerve distribution. Mitchell¹³ comments that causalgia occurs only in nerve injury and not in com-

plete nerve severance. With the latter the predominant picture is that of marked paralysis, edema of involved area and thickened, dry skin but with no significant pain.

The pain is followed usually by vasomotor and trophic changes which may occur immediately or only weeks later. Often, because there is a delay in objective signs, many of these patients are considered neurotic or malingering. Progressive trophic and vasomotor changes result in a smooth, hairless, glossy skin, cyanotic and wrinkle-free. The skin gradually loses its elasticity, and there is shrinkage of the subcutaneous tissue. The nails develop increased curvature in their longitudinal axis, and there may be retraction of the cuticle leaving an exposed sensitive nail matrix. Sweating over the involved area may be absent, diminished, or increased, often with altered odor. In some cases a periarticular swelling develops which may progress to periarticular fibrosis and partial ankylosis. Vasomotor and trophic changes can vary markedly.

There are two predominant types of picture:

1. *Sympathetic hypertonia with vasoconstriction predominating.* This is the more common. The extremity or involved area is cold, pallid or cyanotic, the skin thin and glistening, with profuse sweating. Also there is loss of hair, tapering of digits, and curvature of nails. Relief may be gained by measures that promote vasodilatation, i.e., application of heat or generalized febrile reaction. Subjectively the involved portion feels cold. Subsequent "hard" edema may develop.

2. *Sympathetic hypotonia with vasodilatation predominating.* The extremity or involved area is warm, hyperemic, dry, often scaly, but not glossy. The hair is long and coarse. There is loss of elasticity of the skin, with atrophy and decreased subcutaneous tissue, with marked wrinkling and decreased sweating. Relief may be obtained by the application of cold or other measures resulting in vasoconstriction. In both

types hyperesthesia is frequently noted, with or without patches of anesthesia in and around the hyperesthetic zones.

Thus there may be found two distinct pictures, each of which may be associated with unbearable causalgia-like pain or pain of lesser degree. They fall definitely into line with the type of autonomic imbalance present, can occur soon after injury or later, and can change one into the other. The vasodilatation phase, if it occurs, usually precedes the vasoconstriction phase. Mitchell, like most observers, found the vasoconstriction type to predominate. Later a physiological mechanism that may explain the relative predominance of either type will be offered.

Bone and joint changes are an important part of the picture also, but, like the rest of the syndrome, inconstant. These can occur in either type, despite the fact that experimental histologic examination¹⁶ has consistently found vasodilatation in the bones showing acute spotty bone atrophy, or Sudeck's osteoporosis. In the bones there is fairly characteristic spotty atrophy appearing in four to six weeks, demonstrable by x-ray. Usually it occurs in the metaphyseal and epiphyseal areas, especially of the metacarpals and metatarsals. Serial x-rays are important in picking up the early coarsening of trabeculae and other changes leading to the spotty, and ultimately generalized, osteoporosis, due to the fact that all degrees of bone changes may occur and may stop at varying levels. The cancellous portions of the carpals, the tarsals and the metaphyseal region of the long bones may also be involved. These sites are supposedly most sensitive to the changes because they are the most vascular parts of the bones, and thus most sensitive to the hyperemia that has been hypothesized as accompanying the sympathetic dystrophy. Many workers are confident that the bone lesions are due to a hyperemia of bone, but this necessitates the task of reconciling vasodilatation in the bone with vasoconstriction in the skin and other involved tissues. An intensive histologic and x-ray study by Rieder, and other European and American work-

ers,^{12, 16} demonstrates vasodilatation in clinical and experimental cases of Sudeck's atrophy, which is the name applied to a type of reflex sympathetic dystrophy in which spotty osteoporosis is prominent, but this work is controversial. Some consider the bone changes as secondary phenomena, and not an important part of the clinical syndrome that is being considered. It should be noted that after long progression the spotty osteoporosis of Sudeck may blend and become obscured with development of a generalized osteoporosis of disuse.

An important cause of disuse is the joint changes that may occur. Early there may be periarticular edema which subsequently undergoes transition to a periarticular fibrosis with ankylosis and loss of joint junction. Also described is pannus formation¹⁶ in the joint's synovial membrane with cartilage destruction and ankylosis. Some of these changes resemble the pathologic findings of rheumatoid arthritis, e.g., the pannus formation, periarticular fibrosis, and vascular derangement. Further work with the sympathetics may cast more light on that disease. It may be that some types of rheumatoid arthritis are actually peculiar types of reflex sympathetic dystrophy and may respond to sympathetic surgery. Use of therapeutic measures to be discussed later certainly deserve investigation in that disease.

DURATION AND SEVERITY

There is no way of predicting duration and probable severity of these dystrophic cases. They may remit at any time after weeks or months, and the severity may seemingly be out of proportion to the underlying lesion.

MECHANISMS

Examination of the clinical syndromes strongly suggests that the autonomic nervous system is involved in the manifestations of the disease process, whether causalgic pain or spotty osteoporosis is present, whether vasomotor and other trophic disturbances are the main manifestations, or whether there is sympathetic hyperactivity with the cold, sweaty hand, or hypoactivity

with the warm, hyperemic hand. Leriche and others were impressed enough with these findings to attempt surgery of the sympathetics, e.g., periarterial sympathectomy, ganglionectomy, and ramisectomy, and their successful results helped incriminate an altered autonomic nervous system as the basis for the disease processes. To explain all the varied findings many workers have advanced neurophysiologic mechanisms and much work has been done in experimental laboratories. The definitive work, however, is still undone. A brief summary of some of the mechanisms offered helps visualize the possible background and etiology of the syndrome.

A. Doupe, Cullen and Chance⁵ have advanced the theory that causalgic pain is due to activation of sensory fibers by the overflow of sympathetic impulses. Thus, inflammation stimulates sympathetic nerve impulses which alter the excitability of adjacent fibers. Since the sympathetic fibers in mixed nerves run alongside posterior afferent sensory fibers, they can influence them by "overflow of impulses". This can occur at the site of or distal to injury to the nerve. It is supposedly due to peripheral nerve nutritional changes which disturb the insulation between sensory and sympathetic fibers. This offers an explanation for nerve block peripheral to an injury relieving causalgic pain and explains the value of sympathectomy since it blocks excessive efferent impulses.

B. Homans⁷ offers a tentative theory based on Moore's findings¹⁴ of sensory nerves in arteries and veins. Irritation of these endings in vascular damage causes afferent impulses which go to the cord, synapse with sympathetic fibers, and then go to the extremity thus causing the changes. There may also be local reflexes with the sensory nerves in the arterial walls joining sympathetic fibers in the walls of the larger vessels. This could offer an explanation for the relief obtained by arterial and venous wall nerve stripping, and also for the success attained with sympathetic surgery.⁹

C. Sir Thomas Lewis' axon reflex¹¹ also

has been adapted by Miller and DeTakats¹² to explain the syndrome. This theory hypothesizes that in response to stimuli of the peripheral nerve, there is a peripheral reflex effect within the distribution of the nerve without need for impulses to return to the central nervous system. The vasodilator efferent fibers of the posterior root system secrete a pain substance locally which causes the characteristic hyperalgesia, vasodilatation, and hyperesthesia. Sympathetic block here presumably accelerates circulation by promoting vasodilatation and overcoming spasm. Thus, the increased blood flow washes away the pain substance ("Nocifensor" substance of Lewis). This may also explain success often obtained by blocking a nerve distal to an injury. Added support for this theory is the relief of pain achieved in cases of herpes zoster following paravertebral block.¹²

D. Other concepts include the internuncial pool of Lorente de No² which Livingston¹⁰ has adapted. Persistent pain stimuli from the site of trauma set up a vicious cycle of reflexes which spread through a pool of many neuron connections upward, downward, and across the cord, with resultant discharge of impulses along the sympathetic nerves controlling vasomotor tone, and sweat glands.

E. Rieder¹⁶ and others¹² have done elaborate histologic examinations of bones with x-ray correlation, in large series of clinical and experimentally produced acute spotty bone atrophy (Sudeck's atrophy), and found that vasodilatation was consistently present in the bones. Rieder concluded that vasodilatation with resulting congestion produces a local acidosis which promotes calcium dissolution in the bones with resulting osteoporosis. Also there is relatively diminished osteoblastic activity. Congestion can also account for the vasodilatation type of syndrome. However, this does not explain the vasoconstriction type which can often occur following injury with no preceding vasodilatation apparent clinically.

F. A suggestion as to the cause of relative predominance of vasodilatation or vas-

oconstriction can be cited.^{3, 12, 15} Strong stimulation of the central end of an afferent nerve elicits a pressor effect, whereas weak stimulation produces depressor effects. This simple physiological finding may be the explanation.

The mechanism is thus not settled. Several of the explanations offered may play a role, and there may be predominance of different mechanisms in different types of the syndrome. Whether sympathetic fibers can carry afferent impulses and vasodilator fibers, or whether posterior root sensory fibers can carry vasodilatation fibers, are problems being worked out. The old law of Bell and Magendie has been modified. Further knowledge of the autonomic nervous system may elucidate the problem. However, the possibility of an additional "physiological" nervous system such as the "nocifensor" system of Lewis, may enter into consideration. Nevertheless, the theories discussed here are often good rationalizations which help visualize the cause of signs and of symptoms, and the response obtained from present therapeutic methods.

MANAGEMENT

Prevention¹⁶ is an important part of the management of the syndrome. This is usually a surgical or orthopedic problem, e.g., fracture reduction and immobilization; careful repair of torn muscles, tendons, and tissues; evacuation of hematomas and foreign bodies. The principles of surgical technique provide for these problems. However, most trouble comes from lesions not so amenable to surgical treatment, e.g., diffuse phlebitis and arteritis, sprains, nerve injuries, freezing and burning injuries. To attempt to protect these patients from reflex sympathetic dystrophy, pain must be relieved; infiltration of sprains, painful hematomas resisting evacuation, and trigger areas that set off painful sensations, is recommended. Early ambulation may be helpful. Excision of foci responsible for pain and reflex phenomena also aids some patients, e.g., excision of inflamed sections of arteries or veins, lysis of bound down nerves, and resection of neuromas. Further, a sympathetic block, as early as necessary,

via peripheral nerve or paravertebrally, may head off the reflex dystrophy.^{16, 20}

Because of the numerous etiologic possibilities suggested, therapeutic measures and their time of indication must be set down in general fashion. Thus, for edema elevation may be helpful. Rest may be very important with properly timed introduction of active and passive movement, alternating baths and Euerger's exercises. Narcotics may play a big role, because continuous pain upsets the personality and the autonomic nervous system on a very high level, with resulting lowered pain threshold and magnification of pain. Upsetting of the autonomic nervous system may also cause vasomotor changes further promoting discomfort. Thus, as is always the case, care of the patient as a whole must be considered. Failure to understand the vagaries of sympathetic imbalance may easily cause the patient to be termed a malingerer or pension seeker.

Despite all these measures and the best of management many patients develop dystrophy syndromes. The severe type of causalgic pain may lead to suicide or amputation. For these extreme cases there are several therapeutic approaches possible.^{9, 10, 21, 22}

A. *Repeated "Trigger Point" infiltration* with procaine offers some success. This presupposes existence of a focus, e.g., a scar, stimulation of which sets off the syndrome of pain.

B. *Sympathetic blocks*, paravertebrally usually, repeated as frequently as necessary are very valuable. These may be needed daily or less often. Concomitantly there is utilized massage and other physical therapy, because the blocks often relax the joints and relieve pain sufficiently long to carry on manipulation.

C. *Sympathectomy*. 1. Preganglionic sympathectomy is most widely used.²¹ This is a recent advance and is based on at least two pertinent findings. First, postganglionic fibers tend to regenerate, whereas preganglionics show less tendency in that direction. Second, severance of the postganglionics causes a hypersensitivity of the

supplied end organs, so that when adrenalin is later released into the blood there is a hyperresponse from the affected parts with increased pain. It is important to note that paravertebral blocks often give no inkling to the possible success of a sympathectomy, and failure of a block is no contraindication to the surgical procedure. This procedure is very valuable; it has given excellent results in many severe, chronic cases of reflex sympathectomy dystrophy. It has been applied widely with some success and may be used in certain cases of Buerger's disease⁴ and Raynaud's disease.¹ Some results of value have been reported lately in cases of intractable angina, shoulder-hand syndrome, and the cryopathies^{17, 19} (frostbite, immersion foot cases). As with any therapeutic measure, the indications and contraindications must be considered.

2. *Periarterial and perivenous stripping* is a procedure that has been advanced most strongly by Leriche.⁹ It has some value but its indications are definitely restricted. It is of especial value in localized phlebitis and arteritis, and in segmental thrombosis or embolized vessel, for local resection or ligation of a vessel with simultaneous stripping of the perivascular nerves. Thus, in thrombophlebitis with ligation of the femoral vein to avoid embolic phenomena, dramatic results are often seen immediately postoperatively (relief of pain and spasm), probably due to the stripping of the vessel before ligation with interruption thereby of the reflex dystrophy. In general, Leriche urges that this type of procedure is best applied in cases of distal injury where the artery can be stripped in the most proximal part of the arm or thigh. Otherwise it is difficult to get up high enough to interrupt nerves going to the involved area.

D. *Drugs* are new in this field. Tetraethyl ammonium compounds act on the sympathetics over the entire body. Many extravagant claims are being advanced for them. Whether they may be of value is not clear, but they deserve further experimental attempt. Other European work⁹ has been going on for years with use of large dosage of salt or partial suprarenalectomy,

under a working hypothesis that increased salt will inhibit adrenal activity and stop the outpouring of adrenalin. This poses a relationship between the adrenal cortex and medulla which is still obscure. However, Russian workers have long experimented in this field, especially in the treatment of Buerger's disease, and they claim good results. As is usually the case in medicine, new drugs probably will obviate the use of surgical procedure. However, at the present, surgical manipulation of the sympathetic nervous system is our chief weapon.

DISCUSSION

There must arise some skepticism over grouping of cases of causalgia, phantom limb, minor causalgia, Sudeck's atrophy and others under a common syndrome. It is true that the causalgic types have a severe pain that overshadows all other manifestations; whereas in other types there may be burning or aching pain of lesser severity which does not dominate the picture but rather shares attention with the vasomotor and trophic changes. However, all the entities mentioned in the introduction, share many mutual characteristics, and their difference is one of degree, a matter of hyperactive or hypoactive sympathetics. Likewise they also share a response to therapeutic manipulation of the sympathetic nervous system, for example, sympathetic block and sympathectomy.

There are other conditions, well known in medicine, which show many of the manifestations of reflex sympathetic dystrophy, but apparently lack the reflex mechanism^{3, 12} These are probably due to a central disorder of the autonomies, in the spinal cord or brain, or possibly in the peripheral nerve. Hemiplegia is one such entity. In the hemiplegic limb there may be evidence of sympathetic imbalance (burning pain, increased warmth, osteoporosis), all ascribable to constant vasodilatation possibly caused by irritation of the central sympathetic center. Sweating may be altered also, and the sweat of the hemiplegic limb may have a peculiar odor. The fingers and toes are often glossy and show

an increased nail curvature. Theoretically these manifestations may respond to a sympathetic block. Often the pain is ascribed to altered muscle balance, or considered thalamic in origin. When severe enough, sympathetic block should certainly be tried. Unfortunately the upper extremity is more often the site of disturbance, and stellate block is not without its own danger.

Another example of nonreflex sympathetic dystrophy is poliomyelitis in which the involved limb may show cyanosis, coldness, mottling, scaling, or glossiness of the fingers or toes. There may be marked exacerbations in cold weather with severe pain. Sympathectomy or block may relieve the pain and allow warming of involved area, and should be considered as a possible therapy. Here again the site of involvement is central, probably with changes in the lateral horns or anterior roots.

There are numerous other disease entities of the brain and spinal cord wherein a subsidiary consideration may be irritation of a sympathetic center or tract. In these cases sympathetic surgery should be considered. However, when there is trophic change due to anesthesia of an area and other unexplained causes, as in tabes and syringomyelia, or when there is complete nerve severance, reflex sympathetic dystrophy is not seen, and sympathetic surgery is usually without result.^{3, 12}

CONCLUSION AND SUMMARY

Causalgia, Sudeck's atrophy, trophoneurosis, and other post-traumatic entities are all manifestations of a single syndrome and should be considered as types of reflex sympathetic dystrophy. Although the etiology may vary widely from gunshot wounds of nerve, to slight sprain or thrombophlebitis, the mechanism seems to be a reflex, with afferent loop constantly bombarded by impulses from the nidus of injury, and with the efferent loop (the sympathetic nervous system) showing either hyperactivity or hypoactivity. The exact mechanism is not settled.

The syndrome of reflex sympathetic dystrophy is more important at this time because timely use of a relatively new surgical

weapon, sympathetic block and sympathectomy, may prevent development of, or may cure many severe dystrophic states.

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HYPERTENSION TREATED BY IRRADIATION OF THE ADRENALS; WITH REPORT OF TWENTY-THREE CASES*

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Shambaugh and Cuttler were the first to discuss the possibility that adrenalin discharges may be involved in the pathogenic

mechanism of angina pectoris. Following the work of Raab, Soule, and Bougoslavskaja in the roentgen therapy of angina pectoris, hypertension, claudication, post-coronary angina of effort, Buerger's disease, and the so-called angiospastic individuals, we treated a series of 23 cases. Our efforts were directed toward evaluating the methods and results of the various investigators.

We wish briefly to summarize the rationale of this form of therapy and acquaint you with the technic together with the breakdown and clinical findings both before and after therapy.

The theory advanced by Raab that anginal attacks are brought about actually by the anoxiating effects of adrenalin discharges upon a heart muscle whose coronary arteries are sclerotic, and thus unfit for adequate compensatory dilatation, is based on the following facts:

1. Adrenalin exerts a specific, intensely anoxiating effect upon the heart muscles which by far exceeds the oxygen requirement for the simultaneous increase of hemodynamic action.

2. Adrenalin is physiologically discharged from the adrenal glands into the blood stream under the influence of physical exercise, emotions, cold, under the very conditions which usually elicit anginal pain.

3. The heart muscle possesses a greater tendency than other tissues to accumulate circulating excess amounts of adrenalin, and likewise accumulates other adrenal catechols.

4. During physical exercise or exposure to cold the adrenalin content of the heart muscle increases while that of the adrenal gland diminishes.

5. Injection of adrenalin is likely to produce anginal symptoms in persons with coronary sclerosis and, if given in large doses, also in healthy persons.

6. Abnormal intense discharges of adrenalin to the blood stream during physical exercise were observed in a number of Raab's patients suffering from angina pectoris. They disappeared in all of the suc-

*Presented before staff of Baton Rouge General Hospital May 21, 1947.

cessfully treated patients in whom the tests were repeated after treatment.

7. The electrocardiographic changes which occur during anginal attacks are practically identical with those following the administration of adrenalin.

8. Patients with tumors of the adrenal medulla often suffer from anginal attacks during which an increased adrenalin level was found in the blood, and which disappeared after removal of the adrenal tumor.

9. Conditions which are known to increase the secretion of adrenalin, such as tobacco smoking, or overdosage of influenza, or breathing of low oxygen concentrations, are likely to elicit anginal symptoms.

Recent experiments by Raab and Soule showed that irradiation of the adrenal glands by single doses of 100 and 1000 roentgens caused slight changes in the contents of the glands in adrenalin and related catechols within two months. The accumulation, however, of such hormonal material in the heart muscles following physical exercise was distinctly diminished two months after irradiation.

Desjardins, Frey, and Engelstad conclude that the roentgen ray sensitivity of the normal adrenal is not greater than that of other tissue; however, the roentgen ray sensitivity of living cells increases with the degree of activity (Holzknecht's law), and the state of overactivity of the adrenal medulla, as well as its nervous secretory apparatus, which seems to prevail in angina pectoris patients, and makes for the possibility of normalizing effects of roentgen therapy upon the adrenals and their nerve supply in these patients, even with a dosage which does not suffice to cause damage to the glands.

At this point it might be mentioned that in some cases it was noted that a second extracardiac factor is essential for the occurrence of pain, namely an abnormal sensitivity of the thoracic sympathetic nerves. Raab irradiated 18 patients over this area, in addition to adrenal irradiation, obtaining excellent results.

In the fine work done by Raab and Soule

in 1940 they reported success in 76 of 100 patients irradiated over the adrenals. Electrocardiograms, blood pressure and effort tests bore this out. Most patients had undergone other therapy without effect or with unsatisfactory results. The mainstay of the previous therapy had been in most cases vasodilating drugs.

Complete, or almost complete, disappearance of anginal symptoms for three to thirty months occurred in 40 per cent of these cases; considerable improvement for six to twenty-four months in 20 per cent; and moderate improvement for six to seventeen months in 15 per cent. In this series one course of irradiation proved effective for 21 patients. Of the remaining, 55 improved, 22 received two courses, 26 three courses and 7 four courses.

To the 24 unsuccessfully treated patients only two courses were given and failures probably could have been reduced by extension of the treatments to one or more additional courses.

Onset of improvement varied from beginning during the therapy to two months after completion, while in most cases it ran between two and four weeks. (The findings correspond with experimental findings in animals whose suprarenal glands showed beginning histologic changes in from a few days to six weeks after irradiation).

In a later report Raab and Soule had a series of 42 cases. In a great percentage of this series the thoracic sympathetic area was irradiated as well as that of the adrenal glands and the percentage of improvement was approximately the same as that discussed previously but improvement lasted up to forty-five months. No symptoms of adrenal insufficiency have been noted in any of the treated cases. Some of the workers routinely treat the paravertebral area extending from the sixth cervical to the lower dorsal as well as the suprarenal gland, and some workers treated only the dorsal sympathetic chain, notably Susmann, Samuels and Bowie, Wasch, Schenk, and others.

T. V. Bougoslavskaja, following the meth-

od of Raab, used irradiation of the adrenals with 31 cases of hypertension with the following results:

1. In 11 patients the blood decreased from 40 to 50 mms. for the systolic and 10 to 30 mms. diastolic after one course of treatment.

2. The general condition of 6 patients improved and their working capacity was restored though there was little change in blood pressure.

3. Twelve cases showed no effects.

In our series we treated the adrenal glands and arranged the size of our field so that the lower dorsal sympathetic chain would be included during each treatment.

Our technic was the use of 250 Kv. at 15 M.A., 50 cms. target skin distance using a filtration of 1 mm. of copper plus 1 mm. of aluminum. The field as described was over the adrenal and lower dorsal sympathetic chains using a cone 15 x 15 cms. The patient was given six successive treatments alternating the right and left sides so that at each treatment 250 roentgens skin dose was delivered. Nausea was the main side effect to be avoided or controlled as much as possible, which we did by instituting a high vitamin B complex intake orally at the beginning of each course of therapy. In some instances the B complex was given hypodermatically, but mostly in oral form using the basic formula of Squibb's, one tablet at each meal and one before retiring.

There are four definite contraindications to therapy:

1. Symptoms of primary adrenal insufficiency.
2. Coronary thrombosis within the past three months.
3. Tuberculosis of the kidney or peritoneum.
4. Cardiac decompensation.

For the grouping of these cases we have selected the classification of hypertensive diseases as used by Hines.

I. VASCULAR HYPERREACTIVE

Persons having a hyperreactive vascular system, seen most commonly in young people. By taking frequent blood pressure

readings variable blood pressures are found. This is really vasomotor instability and is thought to be the early forerunner of hypertensive disease. No one knows the end results of these cases, very little work having been done on this problem. Many of these cases were observed in the service during the war, but the follow-up on them in years to come is not very likely ever to be accomplished.

Case No. 1. White female, age 24, first seen February 6, 1947. Chief Complaint: Pain in left chest (anginal in nature), exaggerated on exertion, duration of two years; radiated around the chest and once down the arm. Nauseated during attacks.

Examination: Blood pressure 140/80; head negative; chest negative; heart no murmurs; pulse 112/min.; abdomen negative; no vaginal done; temperature 97° F.

Laboratory: RBC 4,310,000; WBC 8,800; Differential S.L. 27, L.L. 4, P. 69. Hb. 76 per cent. Agglutinations all negative. Wasserman negative.

X-ray: Chest negative.

Electrocardiogram negative.

Treatment: Nitroglycerine 1/150 gr. Patient stated that she got relief in five to ten minutes after taking nitroglycerine tablets under the tongue, with no change in the frequency of attacks. Deep x-ray therapy to the adrenals was given (six treatments).

Results: B.P. 128/78, pulse 98. Relief of symptoms. Patient stated she had an occasional tightness in the chest when tired but no pain.

Case No. 2. White male, age 22, first seen August 26, 1946. Chief Complaint: Buzzing in ears for eleven months; flash across left eye; worried about his blood pressure. Stated that he had had trouble with fluctuating pressure ever since he entered the service, that he had difficulty getting into the service and had failed the Air Corps examination on several occasions while in the Army.

Examination: B.P. 168/80, Pulse 112/min.; head negative, eye grounds negative; chest negative; heart A2/P2, no murmurs noted.

Laboratory: Urine negative; blood studies negative except for positive undulant fever agglutination, 1 to 80. This was rechecked and found to be the same.

Electrocardiogram essentially negative.

X-ray of the kidneys for a possible Goldblatt kidney negative. X-ray of chest negative.

Blood pressure readings varied from 170/100, 160/98, 155/90, 130/80, 140/90, 138/80. (He stated it had been 160 while taking an examination at L.S.U. Medical Infirmary.) These readings extended over a period of six months.

Treatment: During the first six months only

the usual mild sedatives and vitamins were given with very little relief of symptoms and no apparent change in the fluctuating pressure.

Deep x-ray therapy was given (six treatments to the adrenals). Blood pressure the day treatment was begun was 160/98. Reading following the treatments was 132/78. Relief of symptoms. Reading fourteen days after 132/80. Immediately after exercise 170/100. Two minutes after exercise dropped to 132/80. He has had a complete relief of symptoms and has since passed the Navy air service examination.

Comment: There is no question that this young man has been helped by this treatment. The question whether it will hold up cannot be determined. Hyperactive adrenals will probably give him more trouble unless further treatment is received.

II. LATENT HYPERTENSION (ARTERIOSCLEROSIS)

Persons of older age having a hyperreactive hypertension, may not develop a fixed hypertension but a variable one. As they grow older, they do show definite hypertensive changes such as eye changes, renal changes, and symptoms such as angina, claudication, cerebral symptoms. These cases may or may not have a severe hypertension.

Case No. 1. White male, age 44, first seen November 6, 1946. Chief Complaint: Headache, vertigo most marked after a day's work. No angina or chest pains. History of having had high blood pressure for several years.

Examination: Blood pressure 210/110; head negative; eye grounds negative; chest negative; heart A2/P2, no murmurs; pulse 90/min.; urine negative.

Treatment: Deep x-ray therapy to adrenals (six treatments). Reading of blood pressure 176/100, ten days after.

Results: One month after treatment blood pressure was 149/100, no symptoms. Two months after, blood pressure 170/100, noted the diastolic changed little; three months after, blood pressure 170/90; five months after 196/100. It was decided at this point to give him a second course of treatment which was done (March 1947).

Results: Blood pressure 162/90. Whether this pressure will climb back again remains to be seen. At the present he can be classified as relieved.

Case No. 2. White female, age 64, first seen November 1946. Chief Complaint: Cramplike pains in the region of the heart which radiated down the left arm, exaggerated on exertion or excitement. Very nervous, up 4 to 6 times every night to urinate. Vertigo all the time, stated that when she walked she pulled to the right side.

Examination: Blood pressure 230/120. Pulse pressure 110, pulse 88/min.; head negative, eye-grounds negative; chest negative; heart, no mur-

murs, regular; abdomen negative, vaginal negative. Urine negative.

Treatment: Diet, sedatives, T. C. S. laxative. After one month blood pressure 200/90, little relief in symptoms. Deep x-ray therapy to adrenals (six treatments).

Results: Blood pressure 170/90, complete relief of symptoms; two months after treatment, blood pressure 168/80. No complaints or return of symptoms. Six months after treatment, blood pressure 170/90. Stated that she had been visiting in Texas for a month and had felt no return of symptoms. At present she is relieved of her symptoms.

III. ESSENTIAL HYPERTENSION (DIFFUSE VASCULAR DISEASE)

Divided into four groups graded by the eyeground findings (severity of retinal changes). This group is better called the diffuse vascular disease, progressing over a period of years with a gradual rise in both the diastolic as well as the systolic pressure. The pathology of the arteries is not sclerosis, but fibrosis replacing the elastic tissue of the entire vascular tree. Cardiac and renal symptoms come very late if at all. Their danger lies in the cerebrum when the end does come. Many live a normal life span in spite of their pressure which is gradually progressive from Group 1 to 4.

Case No. 1. White female, age 43. Chief complaint: Severe headaches, accompanied by nausea; blurring of vision, nervousness. These symptoms were progressive over a period of eighteen years. I first began treating this patient twelve years ago at which time she had hypertension around 200 with an elevated diastolic. This pressure has gradually risen more and more each year. Blood pressure of 300/160 has been recorded on one or two occasions. It averages around 240/130 to 260/140 most of the time. Eyeground changes in class 3.

Treatment: This patient has progressed through all the past treatments as they came into vogue, all the way from mistletoe, watermelon seeds, and garlic, down to the sulfacyanates, and now she has had deep x-ray therapy on two separate courses.

Results: None. There has been no appreciable change in either the blood pressure or the symptoms. No change in the eyegrounds before or after treatment. At the present time she is taking absolutely nothing at all. She is still hopeful that someone will find some cure for her before she gets too old to take it.

Case No. 2. White female, age 52. Chief complaint: Vertigo, severe headaches and blurring of

vision. Patient had been suffering from hypertension for over ten years, she stated. When first seen she definitely had cerebral symptoms. Her blood pressure was 260/130. Electrocardiogram did not demonstrate any coronary disease but definite ventricular hypertrophy. The eyeground changes were severe, Group 4.

Treatment: She was given one course of deep x-ray therapy to the adrenals. This she tolerated very well. Little change was noted in the blood pressure but the patient did improve somewhat clinically; she continued at a status quo for a period of four months when one afternoon while cooking a pie in her kitchen at home she staggered and fell. She was brought into the hospital unconscious and never regained consciousness. She lived five days, during which time she never moved her right arm or leg. No autopsy was obtained, but I am sure she died of cerebral hemorrhage. It is interesting to note how well the heart stands up under such terrific pressure in these cases of essential hypertension.

IV. SECONDARY HYPERTENSIONS

Vascular reactions occurring from secondary factors, such as nephritis, Goldblatt kidney (atrophic kidney), Buerger's disease (thrombo-angiitis obliterans), hyperactive adrenals (adrenal medullary tumors), hyperactive carotid sinus, allergy and coarctation of the aorta.

Case No. 1. White male, age 32, a young German Jew. Chief complaint: Buerger's disease. He was thoroughly worked-up at the University of Minnesota and told to come south so he could get well in the warm climate. His chief symptoms when I first saw him were severe angina like pains in the pericardium exaggerated on the slightest exertion and radiating down the left arm. Marked painful swelling of the right lower leg from the knee down; pain in the left leg, and coldness of the feet. He stated that he was unable to walk any distance because of the pain in his legs and chest.

Examination: Blood pressure 122/180; head negative, heart and lungs were normal; abdomen negative; extremities—the lower legs were slightly swollen and the right more so, painful on pressure, numerous small dark brown areas noted. The feet were extremely cold to the touch.

Laboratory and electrocardiographic examinations were essentially negative. He had been told that he had coronary changes. I sent for his records and could not see any evidence of these on the tracings. They did note the effect of tobacco on this case while they had him under treatment.

Treatment: One course of deep x-ray to the adrenals (six treatments) was given. Edema of the right ankle disappeared after the second treatment with relief of pain. No change in the blood

pressure was noted. Six months after treatment he remains completely clear of all symptoms. I put him through very vigorous exercises and he did not have the least difficulty. He passed through the winter without the least discomfort with his legs. The only restriction now is he is not to use tobacco, the avoidance of which I am sure has been of help in his recovery.

CONCLUSION

The cases treated and classified as described above were divided as follows:

1. Vascular Hyperreactive
2. Latent Hypertension (arteriosclerosis)
3. Essential Hypertension (diffuse vascular disease)
4. Secondary Hypertensions

Those cases falling under Class I, Vascular Hyperreactive; Class II, Latent Hypertension, and Class IV, Secondary Hypertension, responded most favorably to treatment. Of these, the most satisfactory response was in Class I first, Class IV second, and Class II third. Little or no response was obtained in the Diffuse Vascular Disease, Class III. The most striking relief was in the patients having angina pain. In every case they were relieved of pain for long period of time or permanently, wherein lies the value of this form of therapy allowing these people to resume a normal life. Its value in preventing Class I from going into Class II is yet undetermined; that will require years of follow-up, which we will attempt to do, the Lord be willing.

* * * *

NOTE: An additional 12 cases have been treated since the presentation of this report. Of these, 8 were in Group I, 3 were postcoronary anginas, and 1 was a case of Buerger's disease. There has been complete alleviation of symptoms in all 12 cases.

In the case of Buerger's disease presented in this paper, follow-up reveals that the patient is now able to take extended hikes of anywhere from two to five miles without any evidence of claudication.

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SPONTANEOUS PERIRENAL HEMATOMA

TWO CASE REPORTS

HARRY Q. GAHAGAN, M. D.

ALEXANDRIA

Patients with spontaneous perirenal hematomas present themselves with varying complaints and oftentimes their symptoms are such that the urologist does not see them initially. Many have marked peritoneal irritation with signs and symptoms of intra-abdominal pathology so that exploratory laparotomies are frequently done. Two patients with this condition have been seen on our service recently and the correct diagnosis was not made preoperatively in either case.

CASE REPORTS

Case No. 1: J. B., colored female, age 47 years, was seen January 4, 1948 with a chief complaint of pain in the right lower abdomen. Her present illness began rather suddenly four days previously when she noticed moderately severe pain over the right side of the abdomen, constant and nonradiating. This was associated with nausea and vomiting, rather marked weakness, high fever, and chills. There had been no trauma of any kind to her abdomen or back. She had noticed mild

frequency of urination and nocturia. Her urine looked cloudy the day of onset but she denied having had hematuria or dysuria. She had never passed any urinary stones. Her bowel habits were unchanged. The pain had persisted, but had become more localized to the right lower abdomen and she also noticed mild pain over the right costo-vertebral angle. Her local physician had given her sulfadiazine which had helped the fever and chills but had no effect on the pain.

Past medical history revealed that an appendectomy had been done twenty years previously. She received treatment for syphilis in 1944. In the same year, she had a hysterectomy done in this hospital for a large fibroid tumor. The surgeon was afraid he might have injured one of the ureters, so the following day she was cystoscoped and catheters were passed to the kidney pelvis with ease. However, a 70 cc. stasis of hazy urine was found on the right side and an excretory urogram done the same day failed to visualize the right pelvis and calices. The left kidney was normal. A diagnosis of old right hydronephrosis, cause undetermined, was made and she was referred to the Urology Clinic but was never seen there.

On physical examination, the right side of the abdomen was moderately tender, worse over the lower right quadrant, and there was slight rigidity. No definite mass could be palpated but a feeling of resistance was noticed in the right lumbar region. There was also mild tenderness over the right costo-vertebral angle. No rebound tenderness was present. Pelvic examination revealed an old inflammatory mass in the right adnexa. Rectal examination was negative.

Urinalysis revealed a few pus cells; urine cultures from the bladder and right kidney were reported positive for *Escherichia coli*; and the urine culture from the left kidney pelvis was negative. Red blood cell count was 3.7 million; the white count was 17,450 with 85 per cent polymorphonuclear leukocytes. Total two hour phenolsulphonphthalein excretion was 65 per cent and the blood urea nitrogen was 18.6 mg. per cent.

Cystoscopy revealed a normal bladder. A catheter could not be passed more than 20 cm. up the right ureter and practically no urine was obtained. Indigocarmine failed to appear on this side. Retrograde pyelogram showed a large mass on the right side extending from the diaphragm down to the level of the iliac crest. There was marked compression of the pelvis and compression with elongation of all the calices (Figure 1). The upper right ureter was displaced medially to the midline. The findings on the left side were entirely normal. Chest plate showed the lung fields to be clear but there was moderate elevation of the right leaf of the diaphragm (Figure 2).

A preoperative diagnosis of right renal tumor with pyelonephritis was made, and on the third



Fig. 1. Retrograde pyelogram showing a large soft tissue shadow on right side with marked compression and elongation of the right calices.



Fig. 2. Erect chest plate showing rather marked elevation of the right leaf of the diaphragm.

day after admission a nephrectomy was done without difficulty through a transverse lumbar incision. It was found at operation that the mass was a huge subcapsular hematoma. Careful examination of the specimen showed that the bleeding had occurred from a small crater in the cortex of the lower pole of the kidney. There was also moderate hydronephrosis, the exact cause of which could not be demonstrated.

Pathological Diagnosis: "Extensive subcapsular hematoma with beginning organization and containing numerous neutrophils. Hydronephrosis and chronic pyelonephritis".

The patient had an uneventful recovery and was discharged on the eleventh postoperative day.

Case No. 2: C. E., 60 year old white male, was admitted to the medical service on April 26, 1948, because of pain in the right upper abdomen and right costovertebral angle, associated with high fever. Onset of the symptoms had been five days previously. The patient also had diabetes mellitus and he had been taking digitalis for heart disease for four years. His urinary habits were normal and there was no past history of urinary diseases.

Physical examination revealed some moist rales in the right lung base. There was moderate tenderness over the right upper abdomen and right costovertebral angle. No definite masses were felt and there was no rigidity.

Urinalysis revealed 3 plus sugar, 1 plus albumin, and microscopic examination showed many pus cells. Stained urinary sediment showed Gram negative rods and Gram positive cocci; urine culture was reported positive for *Aerobacter aerogenes*. Blood urea nitrogen was 18 mg. per cent. The white blood cell count was 14,150; hematocrit was 42 and there were 12 grams of hemoglobin.

The patient's temperature remained 101-102 F. The day following admission he began complaining of severe right lumbar pain which required opiates for relief. A few hours later it was noted that a mass was developing in the right lumbar region which was very tender. Chest plate at this time showed marked elevation of the right leaf of the diaphragm (Figure 3). Upon cystoscopy and ureteral catheterization, 15 cc. of cloudy residual urine were found in the right kidney pelvis. Indigocarmine appeared faintly on this side after fifteen minutes; it was excreted from the left kidney in good concentration after three minutes. Retrograde pyelograms showed right hydronephrosis with distortion of the caliceal pattern: The right psoas shadow was obliterated by a large soft tissue shadow. A right lateral film revealed marked anterior displacement of this kidney. The left kidney appeared to be entirely normal (Figure 4). By this time the patient had developed some right psoas tenderness.

A diagnosis of right hydronephrosis, pyelonephritis, and perinephritic abscess was made and

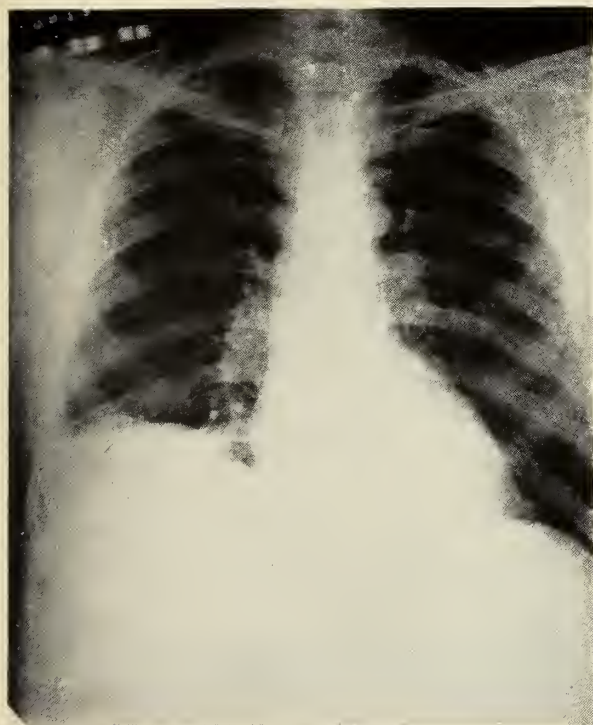


Fig. 3. Erect chest plate of Case II showing marked elevation of the right leaf of the diaphragm.



Fig. 4. Retrograde pyelogram of Case II showing marked distortion and displacement of the right kidney.

the patient was carried to the operating room immediately. However, upon opening the right lumbodorsal fascia, a large right perirenal hematoma was encountered which was recent enough not to be organized. The renal capsule was completely separated from the kidney and was intimately adhered to a thick inflammatory rind of long standing. Some of the hematoma was adhered to a granular area on the surface of the kidney parenchyma. A nephrectomy was done and the patient made an uneventful recovery, being discharged two weeks later.

The pathological diagnosis was: "Kidney with dilatation of calices, hyaline arteriosclerosis and fibrinopurulent pericapsular exudate. Small abscesses present in the surrounding adipose tissue."

DISCUSSION

The earliest mention made of spontaneous perirenal hematoma was in about 1616 by Ballonius in his *Opera Omnia Medica*. In 1933, Polkey and Vznalck made a complete review of the literature on this subject and found approximately 200 cases reported. However, only in 178 cases was there sufficient information given to be included in this study. Since 1933 the author found nine papers on spontaneous perirenal hematoma in the literature (English language) and these added a total of 14 cases.

Etiologically these cases may be classified in three groups: (1) Diseases of the renal parenchyma and smaller blood vessels such as neoplasms, tuberculosis, pyelonephritis, polycystic disease, hydronephrosis, nephrolithiasis, anemic infarcts, and periarteritis nodosa; (2) extrarenal retroperitoneal causes such as aneurisms of abdominal aorta, renal or spermatic arteries, or hemorrhage from the adrenal vessels; (3) hematoma associated with blood dyscrasias such as hemophilia, thrombopenic purpura and polycythemia.

The youngest case reported was 6 days old and the oldest was 89 years of age; 40 per cent occur between 30 and 50 years of age. Males are more commonly affected than females. Approximately 18 per cent of the hematomas are subcapsular (as in case 1 reported here); the subcapsular type usually results from some pathology of the renal parenchyma as listed in group (1) above.

The signs and symptoms will vary con-

siderably and will depend upon the amount of hemorrhage and the underlying pathology. In the acute cases there is sudden pain of great severity over the abdomen, worse on the affected side, and greatest in the lumbar region. The picture is that of an acute surgical abdomen with internal hemorrhage. There is evidence of shock such as pallor, rapid thready pulse, restlessness, air hunger, fall in blood pressure and marked anemia. A mass may appear in the lumbar region within a few hours and this is the sign most suggestive of the true diagnosis. In the less acute and chronic cases the onset is more insidious; pain is present, but not so severe, and may be described as a feeling of weight or fullness in the lumbar region. Signs and symptoms of hemorrhage are much less severe or absent. The temperature may be moderately elevated from absorption of the extravasated blood or from secondary infection. In some chronic cases the onset is unobserved and may be tolerated for many years and be a surprise finding at the operating table or at autopsy. Roentgenograms usually reveal a large soft tissue shadow in the kidney region and the pyelogram shows compression of the kidney pelvis and calices similar to that seen in large intrinsic renal tumors. In the larger hematomas, elevation of the diaphragm on that side is present; this was an interesting point in both cases presented here. Urinalysis is usually of no help in making a diagnosis of spontaneous perirenal hematoma.

Diagnosis is difficult preoperatively, but may be made if one keeps in mind these points: Sudden pain in the abdomen and lumbar region, signs and symptoms of internal bleeding, mass in the lumbar region on the affected side, pyelographic evidence of compression of the kidney pelvis and calices, and oftentimes elevation of the diaphragm on the same side.

All writers on this subject agree that surgical treatment is the treatment of choice; nephrectomy is indicated in most instances. A review of the cases reported shows that in those receiving no surgical treatment the mortality is nearly 100 per

cent; in those cases in which simple drainage and tamponage was done the mortality was 40 per cent; and in those cases that were nephrectomized the mortality was only 22 per cent.

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THORACO-ABDOMINAL INJURIES*

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LAFAYETTE

This presentation will be a brief discussion of the principal factors that caused a decrease in the mortality of thoraco-abdominal wounds during World War II.

Information is derived from association with members of a surgical group and subsequent assistance in the review of 903 thoraco-abdominal injuries, as well as from personal observation, and experience.

Thoraco-abdominal injury is defined as that injury produced by one force or missile which involves the diaphragm, chest, and abdominal cavity. The diaphragm is always injured, and involvement or penetration of the chest and abdomen must be by the same force or missile in order to be a true thoraco-abdominal injury. Theoretically, these injuries may be open or closed. The closed type is relatively rare and of little importance when compared

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with the open type. When the closed type does occur, it is usually associated with crushing wounds of great severity, which result in rupture of the diaphragm with concomitant injuries of the chest and abdominal viscera. The open type is that which is so often seen in war and is the type that will be discussed principally in this presentation. The importance of this type of war wound cannot be over-estimated because approximately 25 per cent of all abdominal wounds are thoraco-abdominal. The advance made during the past war in the treatment of these casualties has been marked, with reduction of mortality from 50 or 60 per cent to approximately 25 per cent. This decrease in mortality has been due chiefly to the following factors:

1. Improved treatment of shock, and preoperative restoration of disturbed cardiorespiratory physiology.
2. Improvement in anesthesia.
3. Improvement in surgical judgment and technic with more utilization of the transthoracic approach.
4. Improvement in postoperative care with special emphasis on keeping the injured lung expanded out to the thoracic wall, and maintenance of a clear air-way.

TREATMENT OF SHOCK

There are three main causative factors in the shock of thoraco-abdominal injuries. These are hemorrhage, deranged cardiorespiratory, physiology, and contamination of the peritoneum and pleura. These factors are usually present to varying degrees; however, severe contamination is usually limited to extensive injuries of a hollow viscus, which may or may not be associated with a severe injury of the diaphragm and pleural involvement.

Treatment to combat shock, in the form of occlusive dressings to the sucking wounds and plasma, is started as soon as the patient is seen by a medical corpsman. The medical corps realized the great importance of early and complete replacement therapy in shock. This realization led to the placement of adequate supplies of plasma and blood for treatment of shock

available a relatively short distance from the point of wounding. This is a most important factor in salvaging the severely wounded because the longer a patient remains in shock the less are his chances to come out of it; and, should he respond, the more likely he is to develop anuria during the postoperative course.

Practically all wounded patients receive morphine. Actually, the majority of them receive too much along the chain of evacuation, only to have its maximum absorption after the patient has been partially brought out of shock with deleterious effects. This is mentioned at this point because it is very difficult to clear the tracheobronchial tree and prepare for surgery a patient who has a depressed respiration from an overdose of morphine. This can be remedied partially by giving deep intramuscular injections, which should be carefully recorded each time by corpsmen. Subsequent doses in the hospital should be given intravenously if indicated.

Replacement therapy is continued in the first priority hospital with plasma which is started while blood is being matched. Practically all thoraco-abdominal wounds have to have blood replaced preoperatively, some in large quantities. However, as a word of caution, it should be remembered that in patients with disturbed chest physiology, ability to stand large quantities of fluid is reduced and these patients should not be given too much, too rapidly.

Deranged cardiorespiratory function is due to loss of functional alveoli for aeration and mediastinal shift. Loss of available functional alveoli results from compression by blood and air in the pleural cavity, pulmonary hematoma, and obstruction of the tracheobronchial tree by blood and mucus. This is combated by thoracentesis, which may be repeated at intervals if necessary; and, if the patient shows signs of bronchopleural fistula, a catheter may be inserted into one of the upper intercostal spaces and connected to a water-trap. Tracheobronchial obstruction is treated by intercostal nerve block to relieve pain so as to produce a more effective cough and tracheobron-

chial catheter aspirations. Improvement in the cardiorespiratory embarrassment of some of these patients following tracheo-bronchial aspiration stamps this procedure as a great aid in preparing these patients for surgery. In many instances there is considerable dilatation of the stomach, with respiratory embarrassment, even if the intra-abdominal injury is minimal. It is mandatory that all thoraco-abdominal injuries should have preoperative decompression of the stomach so as to help respiratory distress and prevent aspiration of vomitus during anesthesia. Most of these patients suffer from insufficient oxygenation of the tissues; so oxygen is given to increase the amount of oxygen available to those alveoli that are functioning. It is usually started on admission and continued during the postoperative phase as indicated.

The main method to combat massive contamination of the peritoneum and pleura is by early operation. Massive contamination of the peritoneum and pleura is very shocking, and often these patients will continue to show a rapid pulse and low blood pressure, even after replacement therapy and cardiorespiratory equilibrium have been restored. In any thoraco-abdominal injury in which there is perforation of an abdominal viscus with contamination of the peritoneum, and in many instances the pleura, it is considered best to operate as soon as the condition of the patient permits, or at a time when the maximum point of improvement has been reached.

ANESTHESIA

It is generally agreed that endotracheal anesthesia given by a qualified anesthetist is one of the greatest factors in the reduction of mortality in thoraco-abdominal wounds. The anesthetist plays an important role for, in addition to putting the patient to sleep, he relieves the surgeon of responsibilities by directing the treatment of shock and keeping a clear airway at all times. He may also assist the surgeon in preoperative and postoperative care by intercostal nerve blocks, intratracheal aspirations, and bronchoscopy.

In many instances, these patients show

considerable improvement following intubation, aspiration, and administration of oxygen-ether by the closed method. During the operation, the lung is expanded periodically and allowed to collapse to facilitate exposure. At the close of the operation, the lung is re-expanded. If it fails to expand satisfactorily, intratracheal aspiration or bronchoscopy is performed.

The most generally used and most satisfactory anesthesia is an induction by nitrous oxide-oxygen with maintenance by ether-oxygen in a closed carbon dioxide absorption system. For those who used the Beecher portable machine, induction seemed to be carried out more satisfactorily and safely by open drop ether.

Preoperative medications most often consisted of atropine gr. 1/150 or gr. 1/100. Since most patients receive adequate, or too much morphine before admission to the hospital, this drug is given only occasionally, and then by vein.

APPROACH AND TECHNIC

Before selecting the approach that is to be used, an estimation of the expected intrathoracic and intra-abdominal injury should be made. It has been definitely shown that the transthoracic approach has helped to decrease the mortality of thoraco-abdominal injuries and it should be used whenever possible and circumstances permit. If a celiotomy is also necessary, it is paramount to perform a thoracotomy first, and then proceed with the celiotomy after the cardiorespiratory equilibrium has been restored. Advantages of a primary transthoracic approach are briefly as follows: (1) It allows an early and direct attack on the chest pathology with efficient repair and correction of deranged cardiorespiratory physiology. Infection of the pleura may be reduced by irrigation and lavage of contaminated cases. (2) Certain upper abdominal organs can be more easily cared for and this may be accomplished under a lighter plane of anesthesia because abdominal relaxation is not necessary. Splenectomy and repair of injuries in the cardiac region of the stomach are more easily handled through this approach than any other. A colostomy may be performed with the

colostomy opening more distal from the incision than would be possible if an abdominal incision were made. (3) The diaphragm can be repaired more easily and effectively from above. (4) The postoperative course is smoother and there is less pain than usually is found in cases in which the abdominal incision has been used. Also, the patient may become ambulatory sooner and may be moved sooner.

It is my belief that there is no indication for primary celiotomy in thoraco-abdominal wounds when adequate anesthesia and facilities are available. The diaphragm should be repaired first and from above in practically all instances. The early correction of chest physiology by closure of the diaphragm and chest wall following removal of blood clots and re-expansion of the lung before performing other procedures is a principle which has caused little or no controversy. Nevertheless, there are some who believe lower lateral lesions, even on the right, should be attacked primarily from the abdomen. Even if the lesion is low down in the costophrenic sinus region, it is better first to repair the diaphragm and chest wall and re-expand the lung by aspiration of blood and air from the pleural cavity. This can be accomplished by debriding and enlarging the wound of entry and grasping the opening in the diaphragm with Allis forceps. It then can be sutured easily and dropped back in position. If the abdomen is opened first, a sucking wound is produced, and this may be more serious than is expected. Closure is likely to be very difficult through the usual type of abdominal incision in this type of injury, and abdominal manipulation may cause more contamination of the pleura by bowel contents being sucked into the pleural cavity. How much can and should be done through the diaphragm depends on several factors. For anatomic reasons, exploration on the right side is limited to the liver, right kidney, hepatic flexure of the colon, and, in some instances, the duodenum. On the left side, most of the remaining organs can be explored, with the exception of the lower ileum, ascending colon, and almost all of

the descending colon. The main factors that cause abandonment of surgery started through the diaphragm are: (1) Poor condition of the patient, and (2) possibility of severe contamination of the pleura. Usually, when there is extensive colon damage or small bowel damage that necessitates resection, it is wiser to close the diaphragm and chest after controlling hemorrhage and proceed through an abdominal incision. The condition of these patients always improves following control of gross hemorrhage, closure of the diaphragm and chest with expansion of the lung. In handling colon wounds through the diaphragm, it is a good policy to close the openings hurriedly as soon as they are found. This prevents further gross contamination of the peritoneum and pleura while colostomy (exteriorization) is being performed.

Incision: In order to have adequate exposure, the thoracotomy incision should be between the eighth and tenth ribs. If the wound is in this area, it may be debrided thoroughly and extended. A rib may be resected; however, the intercostal space with two rib spreaders gives just as good exposure. There seems to be no indication for the combined incision across the costal arch. Closure of the incision is performed in order to secure a permanent air-tight closure and one that is least likely to become infected and break down. A thorough debridement and an anatomic layer closure without too much tension is the best prophylaxis against a breakdown of the incision or wound. When the defect is large, adjoining muscle flaps should be utilized freely to secure an adequate closure. There seem to be no deleterious effects in closing the skin to secure a good closure in those areas where there is sparse musculature.

Drainage: It is safer to use at least one intercostal tube connected to a water-trap. As a rule, it is inserted in an upper anterior interspace, usually the second in the mid-clavicular line. It facilitates expansion of the upper lobe and takes care of transient bronchopleural fistulae.

A second catheter is frequently used in

cases where there is considerable lung damage and contamination. It drains fluids or pus that may collect and also acts as a check valve against bronchopleural fistulae.

Drainage catheters should never be brought out through an incision or wound.

Diaphragm: It must be realized that thoraco-abdominal injuries always involve two spaces and, in many instances, a third. The pleural and peritoneal cavities are always involved and, in many cases, the retroperitoneal space. The surgeon's aim should be to separate these spaces as in their normal state and use surgical repair and procedure that will allow them to remain separated during the postoperative course.

Many of the complications, such as subphrenic abscess and bile empyema, can be prevented if the diaphragm is repaired efficiently and the associated liver wound adequately drained. These complications were rather frequent early in the war but showed a marked decrease with experience and attention to the above points.

In order to make a good repair the diaphragm should be sutured from above; on the right side, it is almost imperative to work from this approach. Suture material should be silk or cotton, and a two layer closure should be performed if time and the patient's condition permit. Crushing the phrenic nerve is not necessary and, in all probability, does more harm than good when performed. It is difficult to conceive how a patient can aerate the involved side, cough, and clear the bronchial tree in the presence of diaphragmatic paralysis.

Subcostal drainage of liver wounds should be through an adequate opening, and at least two drains should be used in order to obtain more suitable drainage. A subcostal incision, $1\frac{1}{2}$ to 2 inches in length, should be made and not a "stab wound" which may vary greatly in size and efficiency. If the wound perforates the liver, drains should be placed above and below the liver and brought out together. When drainage of the subphrenic space is adequate, no collection occurs which may strain or break through the repaired diaphragm. On the left side, breakdown of a repair

may be more serious, and acute herniation of the stomach and bowel into the left pleural cavity may result in a patient already critically ill.

The retroperitoneal (perirenal) area should be drained laterally and posteriorly in kidney wounds if nephrectomy is not indicated. If possible, the retroperitoneal space should be separated from the peritoneal cavity by suture. Here again adequate drainage is important. If the kidney is damaged considerably, there may be continued drainage of blood and urine which will follow the course of least resistance.

POSTOPERATIVE CARE

Immediate postoperative care is directed to the treatment of postoperative shock. Here again, the importance of shock is realized when it is found to be the most frequent cause of death on the operative day, and on the first and second postoperative days. Replacement therapy is continued and is gauged by hematocrit and plasma protein determinations when the facilities are available. In general, the care of these cases is directed toward the treatment of both the chest and abdominal conditions.

Since the most frequent complications are found in the chest and it is probable that more patients with chest injuries die from poor postoperative care than poor surgery—emphasis should be directed to the handling of the chest postoperatively. It is improvement in this factor that apparently has led to a decreased mortality.

By maintaining cardiorespiratory equilibrium in the postoperative phase, these patients are assisted greatly in recovering from postoperative shock and, in addition, complications are reduced to a minimum. This is accomplished by maintaining a clear airway and by keeping the lung expanded out of the chest wall. It is begun at the close of the operation when the anesthetist aspirates the tracheobronchial tree and bronchoscopes the patient if necessary.

After the patient is taken to the ward, a clear airway is maintained by judicious sedation, an effective cough, which is facilitated by intercostal nerve block when indicated for pain, tracheobronchial aspira-

tion, and bronchoscopy, if necessary.

Tracheobronchial aspiration is a very simple and effective procedure. Blood, mucus, and later, pus may be aspirated, and in the patient who cannot cough or expectorate efficiently, it is of great aid in clearing the tracheobronchial tree and preventing postoperative atelectasis and pneumonia. The lung is kept expanded by repeated aspirations and careful periodic checks of the intercostal water-trap. One tube placed in an upper interspace usually will facilitate expansion of the upper lung field and can be removed on the second or third postoperative day. If no drainage or no low posterolateral tube has been used, the chest should be aspirated daily until the pleura is dry and the lung expanded. The occasional development of a bronchopleural fistula necessitates the insertion of an intercostal catheter connected to a water-trap. By keeping the lung expanded, especially the upper lobe, the incidence of empyema is decreased; and, if it does happen to develop, it is localized in the lower chest where it is relatively easy to treat.

Nasogastric suction is used in all cases in which there is a perforated hollow viscus or ileus, and it is maintained until peristalsis is re-established satisfactorily. This decompression of the stomach and intestine also contributes toward deep respiration and a more effective cough with resulting clearing of the air passages. There is no set time limit for upper abdominal decompression, but it should not be used without reason beyond four to five days because of the possibility of masking a bowel obstruction.

Since kidney complications with oliguria and anuria are rather frequent, a careful check of intake and output is made during the postoperative course. The amount of fluids given by vein is gauged by the output. Precautions should be taken against overloading the pulmonary circulation. Saline should be given cautiously in all cases because of possible impaired renal function and the tendency to development of pulmonary edema in patients with disturbed cardiorespiratory physiology.

Penicillin and sulfonamide therapy undoubtedly have played a big part in the reduction of complications and mortality of thoraco-abdominal injuries by prevention and control of infection. It is impossible to estimate to what extent the decrease in mortality has been due to these drugs; "nevertheless, without proof, it is considered that this reduction in mortality is a reflection, more likely, of a greater knowledge and experience in dealing with the problem of the thoraco-abdominal wound as a whole, a greater appreciation of the thoracic implications and complications, a greater experience and facility of the individual surgeon and anesthetist in the operative treatment, and, lastly, a keener appreciation and attention to details of preoperative and postoperative care".²

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SUBTALOID DISLOCATION OF THE FOOT; CASE REPORT OF THE OUTWARD TYPE

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Subtaloid dislocation of the foot is a relatively rare injury, usually resulting from a fall which causes torsion of the foot. The talus remains in the ankle mortice when the foot is torn loose at the subtalar and talonavicular joints. The dislocation may be inward, outward, forward, or backward, the displacement being dependent upon the direction of force causing the injury. There is complete or severe tearing of the lateral ligaments of the ankle joint and quite frequently an associated fracture of the talus. Successful treatment of this unusual condition presents a real challenge to the ingenuity of the attending physician. It is the purpose of this paper to present a case of the outward type and to discuss this rare condition.

CASE REPORT

I. C., age 19 years, white male, was first seen on August 9, 1947, complaining of severe pain and deformity of the right foot. The background of his

medical and surgical history was without significance. He stated that on August 8, 1947, the ladder on which he was standing slipped, causing him to fall to the concrete sidewalk below.

He did not remember whether he jumped as the ladder began falling, or whether he came down with the ladder, but believes the right foot struck the curbing of the sidewalk. All the weight of his body came down on the right foot. The injury was extremely painful and he could not rise from the fallen position. His fellow workers assisted him to a standing position and he then noticed that the right foot was deformed with a shift to the outside. An ambulance was called and he was admitted to the local hospital within fifteen minutes of the accident. His family physician arrived in approximately thirty minutes and, at that time, a hypodermic injection of morphine was

given. Some relief was obtained from the morphia, but the patient noticed that the foot was considerably swollen with "cramping up" of the toes and a bluish discoloration on the medial aspect just below the ankle. A general anesthetic was given and an attempt made by the doctor to reduce the deformity. This was unsuccessful, for the patient awakened a few hours later to find the foot still very painful and deformed. No plaster was put on the extremity, but a posterior right angle splint was applied to the foot, ankle and lower leg. Morphine was given at regular intervals during the night and the next day for pain. At 5 p.m. on August 9, 1947, he was referred to the writer. A roentgenologic examination was made which showed a subtaloid dislocation of the right foot with complete lateral displacement of the calcaneus, navicular, and remaining bones of the foot. There was a



Fig. 1. (a) Lateral view of right foot in which talus is rotated forward and downward. (b) The complete lateral displacement of the foot from an AP view.

sharp downward rotation of the talus with probable rupture of the medial and lateral talocalcaneal ligaments.

At 8 p.m., he was given sodium pentothal intravenously and an attempt was made to reduce the deformity. It was found that the bones were immovable under attempted manipulation. Open reduction was scheduled at 8 a.m. the next morning. Under general anesthesia, a Steinman pin was driven through the os calcis, a medial incision was made at the inferior border of the talus extending from the navicular approximately three inches. Through the incision a lever was inserted between the os calcis and the talus and, with traction by the assistant on the Steinman pin, strong leverage was used to rotate the talus upward and force the os calcis medialward. A loud cracking sound attended the sudden reduction. The bones of the foot were then moulded manually into their normal positions. The incision was closed with plain O catgut and a plaster cast applied from mid thigh to the toes with the knee in moderate flexion.

The postoperative care consisted of morphine, gr. 1/4, every hour to eight hours as necessary for pain, and 50,000 units of penicillin every three hours as an aid in preventing infection. Fever

medial side of the foot beneath the malleolus. The cast from mid thigh to toes was immediately reapplied and the patient allowed to return to his home with instructions to return in two months.

He was told to report to his family physician if



Fig. 3. Right foot and maintenance of position of the carpals after several months.



Fig. 2. The completed reduction. The Steinman pin in the os calcis was used for traction purposes.

was of the "saw tooth" variety, ranging from 100°F. to 102°. for a period of about seven days. It then subsided to normal. Two weeks following operation, the cast was taken off and sutures were removed. The swelling had subsided entirely and the foot was approximately normal in appearance; there remained some residual discoloration on the

anything arose that he did not understand. The patient apparently had no difficulty, for in subsequent discussion of the case with his physician it was determined that the patient did not contact him. The patient again reported to the writer on October 6th and, on that date, the cast was removed and another X-ray examination made. Excellent anatomical position of the bones was shown to have been maintained, but traumatic arthritic changes of moderate degree were beginning to appear between the astragalus and the calcaneus, and between the astragalus and fibula. No support of any kind was applied to the lower extremity following this examination, but the patient was given instructions to move the knee and ankle as much as possible up to the point of pain and was advised to return for reexamination in one week. Weight bearing to painful limits was allowed and encouraged. One week later, 3/16 inch Thomas heels and main arch supports were used as corrections on the shoes. This gave so much comfort that the patient requested that he be allowed to return to work. Light duty was allowed with gradual resumption of arduous tasks and prolonged weight bearing. On November 15, the pain had subsided to a considerable degree and motions of the foot were practically normal. A very slight limp was noticeable and permanent disability of the right foot was estimated to be approximately 5 to 10 per cent. The patient has not returned since that date, but it has been learned that he is working at his normal duties of theatre attendant without apparent discomfort.

DISCUSSION

The first recorded case of subtalar dislocation was reported by W. Hey⁵ of London, England, in 1810. Several references were made to this type of injury in later reports but it remained for Broca,² in 1852, to properly analyze reported cases and give the name "subastragaloid" to the dislocation. He demonstrated in his paper that the talus remained in the ankle mortice and the calcaneus and navicular, together with other bones of the foot, were displaced. Broca coined the terminology applicable to the different types of dislocation and classified them according to the position of the foot rather than the position of the astragalus. The terminology has not been changed and is used today in describing the various types of subtalar dislocations. Shands¹¹ reported a series of cases in 1928, and in 1942, Wise¹⁴ found 10 cases reported in the literature written between 1928 and 1942. Of these, 7 were of the inward type, and 3 were of the outward type. Shands,¹¹ in a study of 138 cases reported before 1927, points out that the outward displacement of the foot is exceptional.

PATHOLOGY

In the inward type dislocations, a complete separation is found of the navicular from the head of the talus. The talus lies on the lateral side of the foot and on the superior surface of the cuboid. The cruciate crural ligament is beneath the head of the talus and the extensor tendons are medial to it. Ligamentous damage is extensive with rupture or severe tearing of the dorsal talonavicular, talocalcaneal, the interosseous, and anterior and lateral talocalcaneal, and the anterior talofibular ligaments. The os calcis is displaced inward. Severe tearing of the interosseous talocalcaneal ligament necessarily results in the production of the dislocation. In the outward type there is also extensive ligamentous rupture with the navicular, os calcis, and other bones of the foot displaced outward. The superior articular surface of the talus remains within the ankle mortice and the head of the talus lies on the medial side of the foot in relation to the

inner surface of the navicular. In the backward type the os calcis with the navicular and other bones of the foot is displaced backward with the head of the talus resting upon the superior surface of the navicular. In the forward type, the os calcis with the other bones of the foot is displaced forward and the head of the talus rests upon the superior surface of the os calcis.

TREATMENT

The urgency of immediate reduction cannot be overestimated because of danger of sloughing of the soft tissues due to pressure on the deep vessels of the foot. There is obvious deformity of the foot with marked swelling and considerable pain, and reduction should not be delayed in order to obtain a roentgenogram. X-ray examination should be made to confirm diagnosis if it is available but should not be allowed to delay treatment. This is in the nature of an emergency, especially in the presence of circulatory impairment. If the patient is seen within an hour or two of the accident reduction can, as a rule, be accomplished by manipulation with relatively little difficulty. After twenty-four to forty-eight hours have elapsed severe swelling and edema of the foot are such that reduction by manipulation is often impossible. Arthrotomy is indicated when closed reduction is unsuccessful. The incision is made over the prominent talar head either on the medial or lateral sides of the foot, depending upon the type of dislocation that is being treated, and the dislocation is reduced by means of a lever. It is sometimes necessary to divide the tendon of the tibialis posterior, which lies upon the neck of the talus and between it and the navicular, in order to lever the bones into proper position. This is encountered in the outward type of dislocation. The cruciate crural ligament drawn tightly about the head of the talus is a frequent cause of unsuccessful reductions by manipulation but is overcome by strong leverage in open operation. In late unreduced cases, in which treatment has been delayed and there is definite evidence of

degeneration of the articular cartilage, an open reduction with talocalcaneal and talonavicular arthrodesis is the treatment of choice. Compound wounds complicating subtalar dislocations are treated by debridement, reduction, and immobilization. The antibiotics are given freely in controlling contamination and infection. Removal of the talus, formerly practiced in the treatment of such injuries, has been discarded in favor of the more conservative treatment. This procedure should be reserved for badly infected cases or those in which the talus is comminuted badly and beyond repair.

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THE VOLUNTARY FEDERAL HEALTH INSURANCE BILL AND THE NATIONAL HEALTH BILL

Two bills have been recently introduced in the Senate that have a bearing on the problem of state medicine and are of great concern to the medical profession and the public. Senator Hill with others introduced S. 1456, the Voluntary Federal Health Insurance Bill, and Senator Taft with others introduced S. 1581, the National Health Bill.

Both bills are to assist in the problem of providing adequate medical care for all. They are designed to meet a demand in this field without disturbing the doctor-patient relationship and without destroying the independence of the physician, at least at the

start. Both, however, are in accordance with the tacit recognition of a new principle in government that the state has to support the citizens rather than the citizens support the state.

The Voluntary Federal Health Insurance Bill, S. 1456

The voluntary federal insurance plan of Senator Hill would contrive to assure hospital and medical care with "grants in aid," to the states on approximately an equal basis. It gives as its purpose, "to make a high quality of hospital and medical care available to all persons in each State by (a) strengthening and coordinating existing health resources within the State, (b) encouraging and stimulating voluntary enrollment in prepayment plans for hospital and medical care, with emphasis on employer participation and on making such protection available to persons in rural areas, and (c) providing protection to persons financially unable to pay all or part of subscription charges for prepayment of hospital and medical care." The author stated in explanation that the bill would perform the same service for financing hospital and medical care that the Hill-Burton Act is now doing in the building of new hospitals. The individual state authority would determine who would be eligible for such assistance. He further stated that our present system had been too valuable, too effective and too useful through the years to throw it aside for a new system that might not work. "You cannot build a tree . . . Our problem is to take our existing system and continue to make it bigger and better."

The bill corresponds to the principles of the 12-point program which have been urged by the AMA for some years. It would, however, tax existing facilities far beyond their present capacity, either as regards availability of hospital beds or physicians. The operation of the provisions of the bill would include perhaps ultimately two thirds of the population. The same forces that are now working for compulsory federal insurance and state medicine would attempt to expand its provisions to include

all. Central authority by withholding grants in aid could exercise great power in directing the affairs of state authority. The opportunity to enforce so-called civil rights and social equality with Negroes would lie in the operations of such a law. The bill was introduced by a Southerner but greater distortions than this have accompanied the workings of many federal laws.

The National Health Bill, S. 1581

The bill introduced by Senator Taft is less inclusive and its operation would be less of a departure from our present system. The bill is broadly similar to S. 545 of the Eightieth Congress which was opposed in principle by organized medicine at that time. The method proposed is also by grants in aid to the states. These would enable the states to gradually expand the services needed, and to the point where they would be adequate and available to all unable to pay for such. The same objections apply to this bill as to that of Senator Hill except that its operation would be slow; ill effects could be seen and perhaps corrected. The authors modestly state they "do not suppose that they or anyone else had produced the final word in national health legislation. They have studied all the major legislative proposals now pending in this field and are conscious of the peculiar merits and effects of each approach. They fully expect that whatever legislation emerges from congressional deliberation on this subject will not embody the doctrine of any particular faction but will combine features of every major proposal. But they are convinced that no legislation is adequate unless it conforms to certain principles which this bill seeks to express. These principles are:

"1. The quest for good health is a many-

sided, long-range problem and demands a many-sided, long-range program.

"2. The supply of health facilities and professional personnel must keep pace with the effective demand for health services. If this elementary principle is ignored, a serious lowering of quality is bound to follow.

"3. No Government program should call for expenditures beyond the financial resources of Government, which in turn are limited by the degree of taxation which a free economy can support. Deficit financing merely puts off the day of reckoning and must never be resorted to for a welfare program except in cases of desperate emergency when sufficient funds are not available out of general revenue.

"4. No Government program should include activities or expenditures which can be supported by private individuals and groups or by lower levels of Government. On the contrary, government welfare programs must always be framed in a manner and spirit which will stimulate initiative and creative activity on the part of individuals, private groups, and smaller communities."

Consideration of these two bills by solons who have a conservative attitude toward medicine along with S. 5, the state medicine compulsory insurance bill, brings us as doctors to realize that a clamor is being heard in the halls of government for tax supported medicine. Our product is evidently so good that the public wants more than it can pay for and calls on the government to make up the difference. The same popular feeling could spread to rent, shoes and theaters. We would then duplicate many features of former days of the Roman Empire, and with the same result.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

REPORT OF THE PRESIDENT OF THE LOUISIANA STATE MEDICAL SOCIETY

Following is report of the President of the State Society, submitted to the 1949 House of Delegates. This is published because it is felt that the report contains data and recommendations which should be of interest to every member of the organization.

The past year has been one of unusual activity for the entire Society. Whatever we have accomplished has been due to the efforts of various committees and individuals who have given freely of their time. Unfortunately many members of the Society do not realize the extent of our activities or the time and effort put forth by a relatively few to accomplish this work. A greater interest in the various activities of the organization by the membership at large would be most helpful.

Your State Society is in a very healthy condition at the present time. The total membership for 1948 was 1874. Financially we are quite sound which is due largely to the fact that amount of dues was raised to twenty-five dollars several years ago. The added funds from this source have permitted the Society to engage in more activities and to meet various emergencies without having to draw upon reserve funds. It is to be noted, however, that our present income is only sufficient to meet expenses and does not provide any great margin for safety.

We have a number of standing committees, some of which are quite active, but others are very inactive. Some of these committees might be dispensed with and new committees added. A committee on veterans' affairs is needed and in addition there may be others. This subject should be studied during the coming year, either by the Executive Committee or by a special committee authorized by the House of Delegates. It would also seem wise to distribute membership on these committees to include more members. In times past several members have been appointed to three or more committees. True, they have been splendid workers and have given freely of their time, however, the more members we have who are active in the work of the Society the stronger will be our organization. I think the general policy should be adopted of having a man to serve on only one committee. In this way the work will be scattered, drawing more men into the activities of the Society.

You will see from the report of the Louisiana Physicians Service that this company is now in

a very sound financial condition. We have weathered the storm of the first few years and should now be able to expand and give greater service to the people of this state. It is particularly gratifying to state that we have reached an agreement with the Hospital Service Association of New Orleans and the Louisiana Hospital Service Association whereby hospital, surgical and partial medical coverage can be offered to the people of the state in one package. This is considered an important step forward. Every part of the state can now be covered; something we have not been able to do heretofore.

These organizations should have the complete and enthusiastic support of the doctors throughout the state. One is a child of your Society and together they constitute our best answer to the proponents of compulsory health insurance. Their success is assured with your complete support. You should be familiar with their set-up, the type of policy offered, its cost and at all times urge your patients to take advantage of this service.

During the past year the Executive Committee has had under consideration the Red Cross Blood Bank plan. At present there is a committee studying this plan and a report from this committee to the House of Delegates is expected at this meeting. It is my opinion that we should lend this plan our support. The Red Cross is conforming to the wishes of the AMA and at the same time offering a service badly needed throughout the state. I doubt that complete and satisfactory service to rural areas can be furnished otherwise. The use of blood is so often necessary, frequently as an emergency procedure and it should be available at all times. This is something that small hospitals can not accomplish without help such as can be supplied by the Red Cross. Certainly this plan should be given every consideration.

Attendance at the special meeting, held in Alexandria on February 20, was very gratifying. The seriousness of the present situation and the need for action by every member of the Society was well presented. I believe that a more unified and intensive support from the entire membership has resulted from that meeting, and it is regrettable that a good many stayed at home apparently unconcerned about the issue.

At the time this report is written the political situation, if one may speak of it in that term, has improved. Several months ago it appeared that some form of compulsory health insurance would certainly be passed by the present Congress. At present this seems doubtful, however the threat still

exists. I am of the opinion that the combined efforts of the medical profession throughout the country and the efforts of others interested in free enterprise have made an impression upon the people and upon Congress. We can not let up in our efforts but must continue to make people, generally, aware of the dangers of any such plan and the need for preserving our independence from government domination of all of our activities.

We should actively support the program of the AMA. This can be done first by contributing twenty-five dollars to carry on the educational campaign. The payment of that fee is a direct obligation which we should gladly assume. Insofar as I know it is the only fee which has been required by the AMA. We are members of the AMA and have enjoyed membership without payment of dues so there should be no squabble about this assessment to be used to preserve a free profession.

Secondly, we should actively support the broad program as outlined by the AMA in its twelve point health plan and should continue to implement the campaign against compulsory health insurance as outlined by Whitaker and Baxter. We cannot relax in this campaign. Everyone who is interested in free enterprise must continue the fight until the tide of public opinion has been definitely swung from this present socialistic trend. It is important for every doctor to be informed on the subject and to be able to present sound argument against compulsory health insurance. Simply shouting socialism, bureaucracy, and so forth, will not help the cause.

Government participation in health programs is here to stay. It is sponsored by both political parties and urged by lay and professional groups. Some of these activities are needed and are most desirable but every effort must be put forth to direct these activities through necessary channels and prevent complete domination of medical education and practice from Washington. Many other groups are feeling this same pressure from Washington and only by the combined effort of all groups opposed to such socialistic trends can we hope to win. We are opposing a trend in thinking or in government which must be met by sound argument and by alternative plans.

One must realize that there are shortcomings in our present system of medical care. There are discrepancies in its availability and the cost is a

serious matter for a large portion of our population. The medical profession is not responsible for either of these, however the improvement or correction of the situation is our responsibility. If we accept this responsibility and as a profession make a serious and earnest effort to see that adequate medical care is available to all people at a cost within their reach, then we need not fear political control. However if we go back to a state of complacency, letting things jog along, we probably will not be so fortunate in the political field in future years as we have in the past.

You will note that one of the points in the AMA health plan is to encourage the prompt development of diagnostic facilities, health centers and hospital services, originated for rural and other areas in which the need can be shown and with local administration and control as provided by the national hospital survey and construction act or by suitable private agencies. This covers one of the major needs of our state. Louisiana is primarily a rural state and there are areas in the state which do not have adequate medical care. The State Society should formulate some plan or support some plan which will permit the rural parishes to build hospital facilities under the Hill-Burton Act for the care of private patients. We should also formulate some plan to encourage young doctors to settle in rural communities. This will partially be accomplished by aiding the rural areas in building suitable facilities but we might also consider the plan, now in effect in Mississippi, whereby medical students are subsidized provided they will practice for at least five years in a rural community in the state. Rural health needs more than talk; it needs an active plan for the improvement of present facilities. We should accept this as part of our obligation and be leaders in fostering such a plan.

There should be some overall planning board in the state to study the entire medical care problem and attempt to coordinate the program so that no part will receive too much attention. At present charity patients in this state have ample facilities for medical care. There are about twenty thousand hospital beds in the state, approximately fifteen thousand of which are for non-paying patients, leaving about five thousand for pay patients. Obviously no such ratio should exist. Our efforts should be directed to improvement of facilities for pay patients. There does not seem to be any

need for further expansion of charity facilities; certainly no need for subsidizing beds in various private institutions other than for very definite emergency purposes.

We should consider the idea of having the State Society make its own survey of hospital facilities in the state to ascertain how the various institutions are being conducted and to formulate and sponsor a definite long-range program.

I can not close this report without expressing my very deep appreciation to Dr. Talbot and his assistants, who have so ably carried on the duties of the office. They have always given us every assistance possible and are doing a splendid job for the State Medical Society. We all owe them

a debt of thanks for their unceasing efforts.

RECOMMENDATIONS

1. Study of committees.
2. Continued active support of Louisiana Physicians Service, Hospital Service Association of New Orleans and Louisiana Hospital Service.
3. Active support of AMA by payment of twenty-five dollar assessment; also support of its program.
4. More active interest in rural health problems.
5. Survey of facilities and personnel for medical care in the state by State Society with the idea of formulating a definite long-range program.

M. D. HARGROVE, M. D., President

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

"GRASS ROOTS" CONFERENCE

The Fifth National Conference of County Medical Society Officers (Grass Roots Conference) will be held in Atlantic City, Sunday, June 5. This is the day prior to the opening of the House of Delegates, and arrangements have been made so that this Conference will in no way conflict with the Conference of Presidents. The sessions of the Grass Roots Conference will be held in the morning and the evening, and the Conference of Presidents will meet during the afternoon.

The morning session will be devoted to specific county or parish medical society problems, with three panel discussions on:

- I. The problem of emergency calls;
- II. Indigent medical care plans;
- III. The National Education Campaign.

The last hour of the morning session will be given over to questions on the National Education

Campaign, with Mr. Whitaker and Miss Baxter present to provide the answers. Special invitations have been issued to the "Committee of 53" to attend this part of the Conference.

The evening session will be open to all physicians and their wives and will feature talks by Mr. Clem Whitaker, Director of the National Education Campaign, and The Honorable John L. McClellan, U. S. Senator from Arkansas.

DISCUSSION OF COMPULSORY HEALTH PLANS AND CONFERENCE OF PRESIDENTS AND STATE OFFICERS

Discussion of compulsory health plans, for medical care and for disability compensation, will highlight the Fifth Annual meeting of the Conference of Presidents and Other Officers of State Medical Associations to be held at Atlantic City on Sunday afternoon, June 5. The meeting will be held in

the Rose Room of the Traymore Hotel, the day preceding the opening of the AMA general sessions, and it will be open to all physicians.

Cecil Palmer, English publisher, author, and journalist, will tell of the impact of socialized medicine on the British doctor and his patients. Palmer, now completing a tour of America, has been a brilliant spokesman for the British Society for Individual Freedom. An American viewpoint of the British health system will be given by W. Alan Richardson, editor of *Medical Economics*, now in England for a first hand study of all phases of the program.

With compulsory disability compensation programs operating in three states, and Washington and New York the latest to pass such laws, the Conference presents two speakers on this vital question. Edward H. O'Connor, managing director of the Insurance Economics Society of America, will discuss the legislation, and Dr. Bert S. Thomas, medical director of the California program, will tell of the medical implications of cash sickness compensation acts.

The AMA relationship to the state societies will be reviewed by Dr. George F. Lull, secretary of the AMA, and the problems facing the state association at the crossroads will be the subject of a talk by Dr. Clarence Northcutt, president of the Oklahoma State Medical Association. Plans are also pending for the presentation of views on national health legislation by a member of Congress.

ST. MARY PARISH MEDICAL SOCIETY

A meeting of the St. Mary Parish Medical Society was held on March 24, 1949. Dr. Eugene Countiss of New Orleans was the speaker and discussed medical gynecological subjects.

FOURTH DISTRICT MEDICAL SOCIETY

The meeting of the Fourth District Medical Society was held on March 1, 1949, Dr. W. C. Gray of Springhill, President, presiding. A hundred and twenty physicians were present.

A symposium on obstetrics was held. The guest speaker of the evening was Dr. Curtis J. Lund, Professor of Obstetrics at the Louisiana State University College of Medicine. Dr. Lund discussed the "Recent Advances in Neonatal and Fetal Asphyxia."

A brief discussion of the attempts of the Federal Government to socialize medicine was held. The inherent dangers to individual freedoms and to all free enterprise in this country if this bill passes, were pointed out.

EAST BATON ROUGE PARISH MEDICAL SOCIETY

To the Members of the East Baton Rouge Parish Medical Society

Whereas, Dr. C. A. Weiss has been retired from the active practice of medicine for many years due to ill health and can no longer participate in the affairs of the Society; and

Whereas, Dr. C. A. Weiss during his many years of activity in this Society gave freely of his time and efforts in furthering the cause of organized medicine; and

Whereas, during his active association in this Society he was a past president thereof, and a past president of the Louisiana State Medical Society and was a delegate to the State Society for many years; and

Whereas, thru his own initiative, perseverance, hard work, and foresight, he was instrumental in establishing the Indigent Physicians' Fund, now, therefore be it

RESOLVED, that the East Baton Rouge Parish Medical Society by unanimous vote does hereby confer on Dr. C. A. Weiss the title of Honorary Member and be it further resolved that all dues paid by Dr. C. A. Weiss since his retirement be refunded in full; and be it further.

RESOLVED, that in due honor and respect of Dr. C. A. Weiss the annual March meeting of the East Baton Rouge Parish Medical Society, shall hereafter be called the Weiss Indigent Physicians' Meeting at which time a voluntary collection shall be taken from the membership for this purpose and transmitted to Dr. C. A. Weiss during his lifetime to be forwarded by him to the State Society, and thereafter directly to the State fund designated for this purpose; and be it further

RESOLVED, that a copy of this resolution be sent to the State Society and to Dr. C. A. Weiss.

A RESOLUTION

Whereas, Dr. J. E. Blum, a member in good standing of the East Baton Rouge Parish Medical Society, has by self-sacrifice, persistence and practically single-handedly, with demonstrated medical competence and efficiency, made the Greenwell Springs Tubercular Hospital one of the best tubercular hospitals in the State and South, and

Whereas, during a period of eight years, these results were accomplished primarily through the personal efforts of the doctor and furnished a service to the unfortunate victims of this dreaded disease;

Therefore, be it RESOLVED that the East Baton Rouge Parish Medical Society does hereby extend Dr. J. E. Blum an absolute vote of confidence in his professional ability and competence. Be it further RESOLVED that a copy of this

resolution be sent to the local papers, the governor, and the Louisiana State Medical Society.

QUESTIONNAIRE ON SCHOOL HEALTH SERVICES IN EACH COMMUNITY

The secretary of each local medical society will soon receive in the mail a questionnaire on school health services in his community. The American Medical Association in cooperation with the U. S. Office of Education is making a study of school health services through its Bureau of Health Education. The survey is a preliminary step in efforts designed to bring about improvement of school health programs within the framework of the private practice of medicine. For this reason, it is most important that each local medical society complete and return the questionnaire.

The U. S. Office of Education in Washington will concurrently query the schools. Two different questionnaires which supplement and reinforce each other and contain no duplicate questions are being used. The information requested is needed to determine present strengths and weaknesses in school health services, to indicate needs, and to point up action for the future. The questionnaire has been tested prior to printing and all unnecessary questions eliminated.

SUPPORT OF THE PRINCIPLE OF PRIVATE ENTERPRISE BY LAY ORGANIZATIONS

The educational campaign to acquaint the public with the danger of state medicine and the effort to focus the pressure of public opinion on Congress needs the approval by lay organizations. Lists of such organizations that have gone on record as opposing the Compulsory Health Insurance Bill have been prepared at the AMA headquarters in Chicago. In the State of Louisiana the following have gone on record as against such legislation:

- State Federation of Women's Club
- State Medical Society
- Calcasieu Parish Medical Society
- Rotary Board of Alexandria
- Alexandria Lions Club
- Alexandria Chamber of Commerce
- Breaux Bridge Lions Club
- Cosmopolitan Club
- Alexandria Kiwanis Club
- Pineville Chamber of Commerce
- Gonzales Lions Club
- Wisner Garden Club
- Wisner Lions Club

The progress of the Compulsory Health Bill is being slowed down by such representations. It is desirable for lay organizations in each community to formally place themselves on record as opposed to such compulsion and to forward the resolution to this effect to the headquarters in Chicago.

COMING MEDICAL MEETING

The International Post-Graduate Medical Assembly of Southwest Texas will hold their annual meeting January 24-26, 1950, in San Antonio, Texas at the Municipal Auditorium. Dr. C. F. Lehman is President and Dr. John J. Hinchey is Secretary-Treasurer of the Assembly.

OSWALD ALFONSA EADDY

1891-1949

The Shreveport Medical Society has reported the death of Dr. Oswald Alfonso Eaddy of Keithville, La. Dr. Eaddy was a graduate of the Atlanta Medical College, Class of 1914. He was an active member of his Parish and State Society since 1919.

CLIFFORD PHILIP RUTLEDGE

1885-1949

Dr. Clifford Philip Rutledge of Shreveport, La. was reported deceased by the Shreveport Medical Society. Dr. Rutledge was associated with the Highland Clinic in Shreveport. He was a member of the State and Parish Societies since 1915. Dr. Rutledge received his medical degree from the University of Alabama and was in practice since 1913.

ALBION BARNARD CROSS

Dr. Albion Barnard Cross of Crowley, La., died on April 22, 1949. Dr. Cross was a member of the Acadia Parish Medical Society and held membership in the State Society since 1915. He studied medicine at the Tulane Medical School and was a graduate of its Class of 1906.

WOMAN'S AUXILIARY TO THE AMERICAN MEDICAL ASSOCIATION

The Twenty-Sixth Annual Meeting of the Woman's Auxiliary to the American Medical Association will be held at Atlantic City, New Jersey, June 6-10, 1949. Headquarters will be at Hotel Haddon Hall.

The meeting will take place simultaneously with the convention of the American Medical Association and invitation is extended to all members of the Woman's Auxiliary to the American Medical Association, their guests and guests of physicians attending the convention to participate in all social functions. There will be four days of general session of the meeting which will conclude with a

reception and ball in honor of the President of the American Medical Association.

Full program of the meeting may be secured from Mrs. James H. Mason, Chairman, Committee on Arrangements, Woman's Auxiliary to the AMA, 535 North Dearborn Street, Chicago 10, Ill.

ASSOCIATION OF GYNECOLOGISTS AND OBSTETRICIANS OF MEXICO

The First Congress of Obstetrics and Gynecology of Mexico will be held on the 22nd through the 28th of May, 1949. This Congress has been organized, primarily by the Association of Gynecologists and Obstetricians of Mexico and its affiliated societies, and will be held in the Justo Sierra Auditorium and the Hotel del Prado in Mexico City.

The scientific sessions will be divided into five groups, one concerning itself with Aspects of Surgical Gynecology; the second with Medical

Gynecology and Endocrinology; the third with Infertility and Sterility; the fourth with Obstetrics and the fifth, Laboratory Investigations, Radiology, and Physiology.

The program includes invited guest speakers from Argentina, Brazil, Cuba, Colombia, Chile, France, Panama, Peru, Uruguay, Venezuela, Spain and the United States, as well as members of the Mexican profession. The guests from the United States include Dr. Richard TeLinde, of Johns Hopkins, in the Section on Surgical Gynecology, Dr. Arthur Hertig of Harvard, in the Section on Laboratory Investigation, Dr. M. E. Davis of Northwestern University in the Section on Obstetrics, Dr. B. Bernard Weinstein, Tulane University in the Section on Sterility and Infertility and Dr. E. C. Hamblen, Duke University in the Section on Medical Gynecology and Endocrinology.

The Congress is open for registration to interested physicians throughout the world. The secretaries of the Congress are Dr. Carlos D. Guerrero and Dr. Alphonso Bravo, Marsella #11, Mexico City, D. F., of whom inquiries can be made.

BOOK REVIEWS

Abdominal Operations: By Rodney Maingot, F. R. C. S. Eng., New York, Appleton-Century-Crofts, Inc., 1948, 2nd Ed. pp. 1274. Price \$16.00.

"Abdominal operations" has been completely revised, rewritten, and brought up to date. Originally printed in two volumes, the second edition appears in one volume. This does not represent a condensation of material, however, for although obsolete data has been deleted, in its place appears most of the important work that has been done since the first edition was published. Many new chapters have been added on subjects of current interest, some of which were written by world authorities including Dr. Lester Dragstedt, Dr. Stuart Harrison, and others. Current controversial points are presented as such and all sides of each problem are briefly reviewed with enough detail to give the reader a good working knowledge of the problem.

Many new illustrations have been added and the index is much more detailed than in the first edition.

It would be difficult to find any other publication with such a complete coverage of abdominal diseases and their management presented in so few pages.

G. L. JORDAN, M. D.

Human Biochemistry: By Israel S. Kleiner, Ph. D., 2d ed., St. Louis, C. V. Mosby Co., 1948. Pp. 649, pl., illus. Price, \$7.00.

The second edition follows closely the pattern of the first edition. It has the same purpose, namely, to provide a simple text which is neither too basic nor too clinical. In the words of the author, "The present volume is an attempt to bring home to the student . . . clinical aspects of biochemistry without usurping any clinicians domain and without neglecting the fundamentals." The author has sought also to bring the student's attention "to some of the more important research work" in a manner which is "neither too elementary nor too advanced."

It appears to this reviewer that the author has been reasonably successful in attaining these objectives in most of the twenty-five chapters. Noteworthy in this respect are the chapters on vitamins, foods, energy metabolism, and hormones. Some excellent colored photographs of lesions associated with B-complex deficiencies in man are reproduced with great fidelity. Also are included several good black and white photographs of vitamin deficiencies in man and animals. Photomicrographs of stained tissue sections are included in several chapters. The several photographs of patients with endocrine disturbances are new and impressive.

Although in general the chapter on blood is not noteworthy, the illustrations (Figure 18) of the absorption spectra of hemoglobin and its most important derivatives deserve notice. Many textbooks of biochemistry have been quite negligent

or even inaccurate in illustrating blood pigment spectra.

One valuable feature of the book is the chapter on changes in the chemical composition of the blood. In this chapter are brought together most of the practical aspects of blood chemistry which in many textbooks of biochemistry are badly scattered. Although the inclusion of such a chapter of necessity involves some repetition, it is excusable on the grounds that it provides a correlation of a number of otherwise isolated facts.

Of considerable interest to the student of medicine is the concluding chapter entitled "Recent Clinical Applications". Under this heading are considered kidney function tests, the kidneys and blood pressure, dental caries, inflammation, tumors, acid phosphatase and the prostate gland, antibiotics, chemotherapy, mucolytic enzymes, and pyrogens. Most of these subjects have not hitherto been given so prominent a place in elementary textbooks on biochemistry.

WILLIAM B. WENDEL, PH. D.

British Surgical Practice: Edited by Sir Ernest Rock Carling, F. R. C. S., F. R. C. P., and J. Paterson, M. S., F. R. C. S., St. Louis, C. V. Mosby Co., 1948. Volume 3, Caesarean Section to Eyelids. Pp. 524. Price, \$15.00.

Volume 3 of *British Surgical Practice* is a further addition to a comprehensive alphabetic encyclopedia of general surgery and the surgical specialties and covers from "Caesarean Section" to "Eyelids". The typography of the edition is exceptionally good. The numerous illustrations are excellent, and the material is presented in an orderly, lucid manner. Bibliographies are brief, and in many instances are omitted in the current volume, but are designed to appear later in the index volume. The range of material covered is so great that brief presentations are the rule. Controversy is avoided and difficult problems often seem to be over simplified. Points of view, on the whole, are sound and conservative. There is a tendency to omit the more recent developments in surgery. This comprehensive and readable compendium of surgical knowledge and practice should prove to be a valuable and handy general reference work.

VERA MOREL

The Biological Standardization of the Vitamins: By Katharine H. Coward, D. Sc., 2d ed., Baltimore, The Williams & Wilkins Co., 1947. Pp. 224, illus. Price, \$5.00.

This book should be most useful to anyone interested in the use of biological methods in nutritional studies. The first chapter gives an excellent and concise presentation of the general principles which govern biological assay procedures and should be essential reading for the novice in the field. The main portion of the book is devoted to detailed discussion of methods for the determinations of vitamin A, thiamine, ascorbic acid, vitamin D and vitamin E. In each instance precise instruction is given as to the planning of experiments, reference standards, selection of animals, diets, and evaluation of findings. Suggestions concerning the housing and care of animals are included. When several methods are available for measuring a given vitamin, they are compared and evaluated.

The importance of statistical treatment of findings is emphasized throughout the book while the last four chapters deal more fully with statistical methods as applied to bio-assay techniques.

The author, who has drawn largely from her own extensive experience, gives many practical details in outlining experiments. Such information is most valuable but seldom available in publications dealing with methodology. References to recent literature are few. However, the author aimed to stress basic principles underlying biological determination of vitamins and included only techniques highly recommended to anyone planning investigations which involve biological methods.

GRACE A. GOLDSMITH, M. D.

An Introduction to Gastro-Enterology: By Walter C. Alvarez, M. D., 4th ed., New York, Paul B. Hoeber, Inc., 1948. Pp. 903, illus. Price, \$12.50.

This is the fourth edition of the book which Alvarez first published in 1922 as, "The Mechanics of the Digestive Tract". Like its predecessors, this release will undoubtedly be popular because the author has collected into one readable volume much that would otherwise be found only by consulting many diverse sources. Despite the many changes

that have been wrought by successively revising in accordance with the evolution of gastro-enterology, the gradient theory is still the point of departure of all discussions.

In the opening sentence of the first chapter, Dr. Alvarez reminds the reader that the organ of digestion is the small bowel and that most of the symptoms of indigestion appear to arise in disturbances in the motor function of the digestive tract. Each chapter of the book is something of an individual essay in which these central facts are amplified.

The author, throughout the book, attempts to explain how data accumulated by innumerable research workers may be of service in explaining clinical problems in diagnosis and treatment. This blending is attained with a considerable degree of philosophic observation.

The present edition ought to be of great help to clinicians. While unquestionably many of the statements may be contested, the book is stimulating. It should be read by any student of the digestive tract.

SIDNEY JACOBS, M. D.

Diabetic Manual for the Doctor and Patient: By Elliott P. Joslin, M. D., Sc. D., 8th ed., Philadelphia, Lea & Febiger, 1948. Pp. 260, illus. Price, \$2.50.

This current edition of a classic contains a wealth of information for the patient who would understand the diabetes for which he is being treated. As in all previous editions, close attention to the fundamentals of control of diabetes is constantly urged. The conventional expositions of the normal diet, the diet for the diabetic, diabetes as a clinical entity, the complications to be prevented, the method of administering insulin, and bodily hygiene are well presented. Food charts are presented as formerly.

The message of hopefulness is preached again and again. A profusion of illustrations forcibly brings home the point that the properly treated diabetic lives a long and useful life. In a literary style that any patient will understand and enjoy, Dr. Joslin teaches his lessons effectively.

The physician who insists that the newly diag-

nosed diabetic read this little manual will save himself much time in explaining the details of therapy. The physician who reads the manual for himself will learn considerably of the practical methods of helping the diabetic solve his problems of daily living.

SIDNEY JACOBS, M. D.

Shock and Allied Forms of Failure of the Circulation: By H. A. Davis, M. D., C. M., F. A. C. S., New York, Grune & Stratton, 1949. Pp. 595, illus. Price, \$12.00.

In this 595 page book the author assembles much of the experimental and clinical data as well as the theories which have been presented throughout the ages on the various phases of shock and allied forms of circulatory failure. Throughout the volume the author injects observations and thoughts based on his studies and personal investigations. In addition to shock states which occur as the result of trauma, burns, surgical and obstetrical operations, and anesthesia, consideration is given to circulatory failure associated with various diseases, toxemias, and infections.

From the standpoint of its value for purposes of quick references, the conclusions and practical data contained in the book are somewhat obscured in the great array of references. There are extensive bibliographies following each chapter evidencing the tremendous amount of effort which has gone into the preparation of this volume.

AMBROSE H. STORCK, M. D.

Cancer of the Esophagus and Gastric Cardia: Edited by George T. Pack, B. S., M. D., St. Louis, The C. V. Mosby Company, 1949. Pp. 192, illus. Price, \$5.00.

This monograph is a compendium of the articles which were published last year in "Surgery" in the form of a symposium on cancer of the esophagus and gastric cardia. All of the contributors are authorities on the various phases of diagnosis and treatment of cancer occurring in the regions indicated by the title of the book. The great strides which have been made in extending operability, and the surgical attempts which are being made to improve the cure rate in cancers of the esophagus and gastric cardia are presented in concise and

readily accessible form.

There is a combined subject and author index.

AMBROSE H. STORCK, M. D.

plications, sponsored by The American College of Chest Physicians, edited by Edward W. Hayes, M. D.

PUBLICATIONS RECEIVED

Charles C. Thomas, Springfield, Ill.: Fundamentals of Pulmonary Tuberculosis and its Com-

University of Kansas Press, Lawrence, Kansas: The Uses of Penicillin and Streptomycin, by Chester Scott Keefer, M. D.

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PSYCHIATRIC TREATMENT IN PSYCHOSOMATIC ILLNESSES*

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The psychiatric treatment orientation for psychosomatic illness will require at least the following knowledge on the part of the physician: (1) An awareness of the emotions which are prone to cause disturbances in physiology. (2) An understanding of the story of how body physiology is brought under the control of the personality. (3) An ability to discern, through history taking and evaluation of the patient's reactions, the emotional defects or conflicts present. (4) An ability to help him see the way to reduce his conflict and derive from his present environmental surrounding the missing emotional nourishment.

EMOTIONS WHICH MAY CAUSE DISTURBED PHYSIOLOGY

The most commonly encountered emotions are the following:

1. Need for love (approval, appreciation, recognition)
2. Anxiety (fear and worry)
3. Hostility (anger, hate, aggression)
4. Inferiority feelings
5. Ambivalence
6. Guilt
7. Ambition (competition)
8. Envy

†From the Dept. of Psychiatry, Temple University School of Medicine.

*Read at the Twelfth Annual Meeting of the New Orleans Graduate Medical Assembly, March 8, 1949.

NEED FOR LOVE

The need for love is one of humanity's greatest hungers and many other emotions are dependent upon it. From the cradle to the grave humans struggle for it. Some of them have a great love hunger and either have no recognition of what they need or have no technics for obtaining it. Lack of it brings such untoward emotions as frustration, hurt pride, envy, and jealousy. Others have perverted and symbolic ways of obtaining it through excessive use of alcohol, food, sex, or drugs. Others know they need affection, attention, and rewards, and take the conventional kind of actions and responsibilities which bring them. The need for love and its derivatives of approval, appreciation, and recognition is a most important emotional need and sufficient gratification of this emotion is of the greatest importance to health both physical and mental.

There has been a general reluctance to accept the need for love as an actual necessity for health and happiness. It has not had the same scientific standing as a health factor as the chemical symbol for iron, for example, but the more we study man and his various illnesses the clearer it becomes that he can live neither a healthy nor a wholesome life without it.

ANXIETY

Anxiety is one of the earliest emotions aroused and one of the most basic in the whole life history of man. Fear is its conscious representative but the emotions of anxiety itself are largely unconscious. We have to use the word *fear* in order to describe its origin since anxiety arises pre-

dominantly out of two early life situations, namely, (a) fear of physical harm, pain or injury, and (b) fear of the loss of love. When a child is threatened with the loss of his mother's protective presence he sustains uncomfortable sensations both in the mind and body and in describing his reaction to this we say he fears a loss of love (meaning the loss of a friendly presence). Also as the child comes to suffer pain from falls, bumps, rejection, or punishment he dreads its repetition. Its possibilities of repetition fill him with the same uncomfortable sensation and we call this sensation anxiety. Anxiety has two components, one of them being psychic and distressing to the mind in a varying degree. The other, the somatic component, arises from the fact that once the anxiety threshold for the psyche has been reached there is an overflow of the emotional energy by way of the autonomic nervous system to any or all parts of the body. People, in the ordinary course of life, who suffer from too much anxiety are people who in early life lacked a consistent supply of a reassuring friendly presence or who were subjected to too many real pain-inflicting experiences or threats of them. This allows a dread or worry pattern to construct itself, and as life becomes more complex the number of things which threaten a deprivation of love and security or real physical distress increases in number.

Not only does the emotion of anxiety impair one's ability to enjoy life but it has more far reaching effects. If one's energies are used up hoping that by dwelling upon the feared thing it can be averted then there remains too little energy left for happy living. If this phenomenon goes on long enough and severely enough the body physiology can no longer function properly and symptoms of illness have arrived. These come through the mechanism we have already described of the conversion of emotional energy into somatic disturbances through the autonomic nervous system. We then have psychosomatic symptoms.

HOSTILITY

Like the need for love, hostility is also

ubiquitous. Without spending too much time on the philosophical theories as to the origin of hostility, let us say simply that when the human organism fails to find conditions which keep him in a constant state of well being, he experiences an unpleasant emotion accompanied by ideas of retaliation, and the use of force to gain his ends; even of destruction of the person or thing which makes him uncomfortable or which thwarts him. This we call hostility. It is impossible to conceive of anyone in our society without any hostility whatever, but certainly small amounts can be present without too many untoward results. This is true especially if properly blended with the rest of the personality to produce wit or zestful spicy conversation or if it results in a wholesome competition. "Get up and git", or "I'll show them" is an aggressive philosophy which contributes to progress individually and generally. But unfortunately for society a great deal of hostility does not take this form. It does not even find vent in occasional outbursts of anger, righteous or otherwise. It has to be held in check because the child or adolescent does not feel that his environment will tolerate any show of hostility. He fears rejection or punishment so his holding in results in repression—a "burying alive" process of which the mind is capable. The buried or repressed hostility builds up and the more it builds up the more labour another part of the mind has to exert to keep it from reappearing. While this battle is going on there is much less energy available for friendly relations. In fact, the person having this internal struggle is guilty about his bad feeling and feels neither like loving nor that he deserves to be loved. The results of this continual psychopathology may be various things, one example being the obsessive thought that he will harm somebody. However, we are more interested in where it expresses itself somatically. We discover that it goes in several directions to produce upper and lower gastrointestinal symptoms and enuresis, into headache, ticlike movement, probably into epilepsy and skin conditions

and plays a role in hypertension and gastrointestinal disorders. Actually the discovery of these forces of which people are individually so unconscious has long ago been noted by the general population when they observed that situations gave them "headaches", "made them sick", "itch for a fight" and "get their blood pressure up" over something frustrating. Since people are not proud about being irritable, disagreeable, unpleasantly aggressive, arrogant, demanding, tyrannical, or domineering they remain remarkably unconscious of this emotion. But there are tremendous quantities of hostility latent in the human race producing not only serious social problems but many individual symptoms of illness as well.

INFERIORITY FEELINGS

To many it might appear that feelings of inferiority could exist as a social phenomenon but not produce any medical implications. But feelings of inferiority are closely linked up with the basic emotions of love and hate. Obviously the person having feelings of inferiority has not had enough acceptance and appreciation. There are few people who ever feel quite satisfied with themselves but in some persons the feeling of worthlessness can be so deep as to destroy the capacity of the psychic apparatus for maintaining physiological equilibrium. Once a feeling of inferiority is deeply set it is not easy to restore the self esteem to a proper balance.

AMBIVALENCE

Ambivalence is a term given to the condition of holding both love and hate reactions toward a person or the world in general. These impulses may be present practically continuously and show themselves rather subtly, or they may show themselves more superficially and plainly by a capricious change of mood and attitude in which those associated with them are loved one hour or one day and hated and condemned the next. We see men, for instance, who protest how much they love their wife but never listen to her requests, her suggestions, never try to further her plans and never help her in any tangible

way. We see women who protest they love their child but who never allow the child to do anything he enjoys and never let him decide anything for himself. This mixture of emotions which has the descriptive term of ambivalence which portrays it as one emotion can, like guilt, block off the benefits of direct, friendly, satisfying and wholesome human relations.

GUILT

Guilt is a conscience reaction. It is an emotional distress reaction resulting from criticisms by the conscience, the conscience being a well preserved memory pattern of what the parents thought was right and proper. The person holding guilt has reason to feel that he has not been or is not living up to expectations. This emotion can kill the joy of living and may cause the patient to live a life of excessive self sacrifice which in the course of time produces physiological disturbances. As an emotion it acts to block the reception of impulses emanating from others of love and approval. Starvation of the love needs can occur from guilt and the pathophysiology results in the way described earlier.

AMBITION (ENVY, COMPETITION)

The ambitious person does not necessarily have pathological emotions but he certainly runs the risk of being infected with envy or excessive competitiveness. These emotions tend to produce tension, and the professional, financial, and social success of many people has been paid for at a high price; i.e., the price of tension, which is prone to express itself through the nervous system upon many parts of the body. The aggressive component inherent in these emotions plays a large role in the conditions such as cardiovascular disease, migraine, hypertension, and to some degree in many others. A successful person can have achieved his goal by a great ability and a friendly easy going manner but he is in the minority. Ambition with its attitude of competition, and sometimes accompanied by envy, are all too often carried along as unnecessary equipment on the road to success.

THE STORY OF PHYSIOLOGICAL AND MENTAL
INTEGRATION

In the early days and weeks, and even months of the life of the human being, the body physiology is in a state of considerable instability. Well defined patterns and rhythms have not been laid down, such as for mastication, deglutition, digestion, and elimination. Likewise, the sleep rhythm has not been established and it takes time to bring this about. Even the heart rate and breathing are rapid and achieve a slower rhythm as time goes on, and control of the personality develops. In fact, there is a definite correlation between control of the personality and control of the body physiology. However, the situation works just as well the other way, if we state that control of the physiology properly carried out tends to bring about a well controlled personality. The interaction of psyche and soma are inevitably unified in a large measure but the way this comes about merits considerable study.

It is well known that the infant who is not well received, and made comfortable and emotionally relaxed, may have trouble in eating, swallowing and digestion. Refusal to eat or swallow, regurgitation, gas formation, and vomiting are easily aroused as early symptoms when frustration or anxiety appear. Likewise, control of the lower bowel and bladder is always a learned pattern, which takes time, patience and education. While most children, in the beginning, sleep a great deal, they later come to need less sleep and they seem to have to acquire a sense of security and a certain amount of training in order that sleep becomes endurable.

From these well known physiological mechanisms, it can be seen that social life, with the mother as its representative, does a great deal to doctor the early discomforts and dysrhythms of the body physiology. Were it not for her ministrations properly carried out, a child could not become symptom free, even for the short period of health which most neurotic or psychosomatically ill people are pretty sure to

have before a breakdown in the regulation of physiological equilibrium occurs.

So far we have spoken about the commoner and more obvious relationship between emotional control of physiology. However, there are more subtle physiological disturbances, such as those which take place within the stomach or bowel brought about by changes in tonus, blood supply, or glandular secretion. Likewise, there are the circumscribed areas of circulatory disturbance within the skull, as well as affecting the skin musculature and even ductless gland activity.

That emotion affects physiology, no clinician will deny, but many still find it difficult to realize that emotion can cause such widespread and profound physiological disturbances as occur in the body; likewise, it is doubted by many that physiological disturbances are as frequently the cause of symptoms as alleged by others. Finally, it is difficult for some to see the mechanism under which emotion supposedly arising in the brain can affect a part, or parts of the body so far distant.

Alexander (Alexander, Franz, *Research in Orthopsychiatry*, Amer. Jour. of Orthopsychiatry, vol. XIII, no. 2, April 1943) points out that emotion in seeking discharge may choose the voluntary motor system of the vegetative nervous system. He thought as a working hypothesis that those emotions which were not discharged through the voluntary motor system by way of adequate and appropriate motor discharge would leave a chronic tension which would influence vegetative nervous system activity. For example, a man who is in conflict with his employer but cannot do what he wishes or even speak his mind may develop headaches or disturbed gastrointestinal function. This begins to tell us right away what part our therapeutic function must be; namely, to help the patient resolve his conflicts so that he is able to take the most appropriate and mature kind of action possible.

DIAGNOSIS

In hysterical states and neurasthenia the emotional element with specific fears and

preoccupation with body function will serve to orientate us concerning the character disorder present. In some of the more recently studied psychosomatic disorders the emotional factor is not so obvious and differentiation from traditional organic disease entities not so easy.

Of course, always first after history taking is the physical examination, which in most cases is negative for evidence of tissue pathology. Organic disease conditions can be complicated by and aggravated by emotional tensions, but they would need to be considered separately from this paper. Of that large number without evidence of organic disease or at least of no disease related to the symptoms present there are certain phenomena which help us to suspect that emotions are the etiological agent. These people often complain of having suffered the same condition years ago and that it coincided with a period of emotional stress. One patient illustrated this when she told her story as follows: "I had the same symptoms years ago when I tried college. In the first semester I had pains in my chest, rapid heart beat, weakness, dizziness, and lack of concentration. I was homesick and had to give up and come home. My mother said, 'I didn't think college was for you. We'll put you in nurses training school.'" She went through training comfortably, worked three years, married, bore two children, and remained symptom free until her husband was absent two years in the Army and she again felt lonely and helpless in the face of responsibility.

Furthermore, patients with psychosomatic illness are prone to give a history either of much medical treatment with no relief or to have ignored or put up with the symptoms for a long time. In the latter instance it is as if the patient and family had a partial insight into the fact that the departure from a sense of physical well-being was linked up with personal or environmental conflicts. A history of unhappy home life during childhood—quarrelling of parents, poor personal and social adaptation all lead one to feel that the soil for psychosomatic

symptoms is present. A successful and pleasant mannered business man of 45 severely ill with gastrointestinal symptoms and fears of heart disease said, "I never had a close friend in all my life except during my senior year in college. I was nice to people, I think, but I never liked them and never knew how to be close to them. My mother and father weren't sociable people and I never learned the knack of it. I envy those who can do it."

ALIGNING FORCES FOR THERAPEUTIC ENDEAVOR

Finally, having (1) excluded organic disease, and (2) obtained a positive history of actual personality conflict or a way of living which should have produced it, one should (3) be familiar with the studies which have been made of the specific emotional factors discovered in the particular syndrome under treatment. This means one should know the personality profiles (Dunbar, *Psychosomatic Diagnosis*, Paul B. Hoeber, Inc., New York, 1943) or to be familiar with the original studies which attempted to show the basic trends in each symptom picture, as for instance, Alexander and colleagues on the emotional factors in gastrointestinal disorders (Alexander, F., *Psychoanalytic Quarterly*, No. 501, 1934) or Frieda Fromm-Reichmann and her findings on migraine (Fromm-Reichmann, F., *Psychoanalytic Review*, 24:26, 1937). Just as one should know tissue pathology in order to be a good diagnostician and therapist, so one should have a knowledge of psychopathology in order to diagnose and treat correctly in this realm.

Now having prepared ourselves with a positive history of personality maladjustment, no evidence of organic disease and a knowledge of the psychopathology of the condition needing treatment, we are ready for an approach to the therapy of the condition. The psyche is sensitive and learning something new is almost always painful. So we must proceed easily, tactfully, with our information, education, and demands, in harmony with the speed with which the patient can progress. The physician who will have success in the treatment of psychosomatic illness must be as interested in

the social events the patient has encountered during his growth (and the meaning of the term *social events* should be construed as more than wakes and weddings) as he is in the infections and accidents which the patient has encountered. Likewise, he must try to assess the effect of these events upon the mind with some degree of accuracy just as he assesses the effect of disease upon the somatic organism with laboratory work or x-ray.

CASE HISTORY

To illustrate procedure, it will be necessary at this point to choose a specific entity such as a gastrointestinal syndrome. A man of 32, the youngest of three siblings, came complaining of poor appetite, distress after meals, belching, a churning feeling in his abdomen alternating with a weak sinking feeling accompanied by periods of diarrhea. He had been suffering for eighteen months, becoming worse all the time. All studies, including complete gastrointestinal x-ray study, were negative for signs of pathology and he was unrelieved by medication. History of his development indicated that he had been brought up by an oversolicitous, over protective and uninspiring mother. His father, a mechanic without humor, imagination, or interest outside his work, died when the patient was 20 and the latter missed him very much. "The bottom dropped out of things and then I did not know which way to turn." Neither parent had taught him much about how to live; about either working or playing pleasurably. His life had been extremely limited in pleasure or recreation. He did not like the work he was doing. He could not enjoy his family of wife and child. (1) His already limited interests in the world around him had allowed symptoms to begin and (2) he withdrew this interest still further the more he felt it necessary to "take care of himself."

PSYCHOPATHOLOGY

We have a patient then (1) passive, dependent, wanting to be cared for still and emotionally lacking in the enthusiasm for and satisfaction to be gained from work and other interests of a mature man. (2) He has acquired a conviction that he is ill.

He concludes from feeling so bad that he must have a severe illness in spite of what the doctors say, and (3) believing himself ill he fears that every effort will make him worse, so he is utilizing most of his mental energy *taking care of himself*, nursing himself, and in his own way doctoring himself, and in the final analysis *trying to love himself back to health*.

PSYCHOTHERAPEUTIC PROCEDURE

First, we must begin to allay the immediate anxiety by first giving him a reason for his symptoms. He generally knows nothing about the symptom producing effect of emotions and if he is to lose his conviction of his illness resulting from traditional disease producing factors he must be given an explanation. This can be done by citing well known examples of fleeting symptoms in the presence of emotion, such as the sweating, palpitation, dry mouth encountered in stage fright. In some patients, a brief explanation of laboratory experiments already carried out by physiologists, such as Cannon (Cannon, Walter B., "Bodily Changes in Pain, Hunger, Fear and Rage", Appleton-Century Company, New York, 1934) may be helpful. Explanations can be supplemented by charts showing the connections of emotion to viscera by way of the vegetative nervous system. A moving picture such as was used in therapy with the Armed Forces on psychosomatic symptom production can be used—certainly advantageously with groups. Analysis of the origin of popular phrases such as: "It makes me sick"; "I can't stomach it"; "He doesn't have the intestinal fortitude", can be used. Knowing that there is an understandable reason and a nonmalignant one at that for symptoms tends to allay anxiety in most instances.

Next, we try to get the patient to relinquish his strong trend to take such wonderful care of himself. By this we mean his tendency to watch the activity of a visceral organ or his general sense of well-being and try to regulate every activity so as not to make his condition worse. This thinking constantly about how the heart or stomach is working or how he is feeling

each hour was called by one patient "tuning in" on himself. It reduces working efficiency tremendously and may lead to complete invalidism and, of course, reduces sociability and social happiness which is so important to psychosomatic health. This selfcenteredness growing out of the self-induced conviction of illness needs vigorous combatting, and takes time. The time needed is somewhat proportionate to the length of the time the illness has been going on, but also dependent upon the number of diagnoses already given, the amount of nonpsychiatric treatment given, the personalities of the physicians who have treated the patient along with their convictions of the kind of disease present, and finally, the patient's ability to understand, accept and utilize a psychotherapeutic approach.

When it is discovered that the patient is free of an organic disease process he should be urged to undertake normal activity as soon as reasonably possible. If physically healthy, then he should be expected to do what other healthy people in his circumstances do. To expect less is inconsistent and illogical and leads the patient to doubt the validity of the diagnosis made. It is true that just because a diagnosis of psychosomatic illness has been made it does not necessarily mean that the patient is able to resume all normal activity immediately. He often has much to accomplish in personality change and a certain struggle

in front of him to achieve it, but it is nevertheless important that the eventual goal is constantly kept before the patient of healthy, vigorous functioning. There should be no implication made that a protected or limited existence is all that can be expected. The patient with overconcern about a normal heart must be urged to undertake the things which others do, such as climbing stairs and playing golf. The patient with a healthy stomach who is free of specific allergies must be urged to eat an average diet and find the cause of his distress in his emotional life. With every visit he can and must be told, if necessary, "You cannot harm yourself in the way you have been fearing. Go ahead and live like others." If he fails to trust the physician and carry this out, discuss with him why he cannot believe what is told to him. The analysis of this question takes us into the difficult problem of emotional transference and one of the most difficult problems in modifying human behavior, and cannot be taken up in detail in this paper, but each physician can discuss the matter of trust with his patient and carry it as far as possible. Constant encouragement and expectation of healthy behavior along with analysis of what holds the patient back is the subject of each day's session. Current fears and conflicts alternate with material from the patient's past life. A condensed working plan of procedure would be as follows:

SYNDROME OF GASTROINTESTINAL DISTRESS

Status of Patient

His Need from Physician

Means of Accomplishment

Conviction of illness as result of distressing symptoms.

To be given explanation from symptoms—neutralization of fear or distress.

Example
Analogy
Charts
Pictures (Stills and Movies)

Drive to protect self, nurse self, doctor self, love self back to health. Often truculent and excessively demanding of consideration.

To be taught that self interest is valueless, even harmful, and that to ignore self and serve others is productive of strength. To make love and prestige needs conscious.

Re-education
Desensitization
Encouragement
Approval
Follow-up interest
Bibliotherapy

Passive dependent character, wanting love and care and unmotivated to responsibility. Often conscious drive to superiority.

A parental interest which accepts him and his passivity but encourages him to achieve more mature philosophy, without overcompensated drive for superiority.

Interest in progress
Follow-up visits
Encouragement
Creating awareness of the rewards of mature behavior.

After we have explained the meaning of symptoms and dwelt on the problem of his preoccupation with devoting all his thoughts to taking care of himself, we should have made the patient considerably calmer and decreased many of his symptoms. We are now in a position to make him more aware of his deeper needs which lie under the surface. This is where we allow or encourage our patient to talk and watch his conversation and pick out the statements which are helpful in re-education. Our patient with the stomach symptoms referred to above said on the second visit, "I felt so rotten lately, mother said I should come home to her house and she would cook for me. I darn near did it but was ashamed of myself and did not. Only women are supposed to give up and go home to mother." On another occasion he said, "I get so worked up at work, I wouldn't stay if it weren't for my boss. He's been like a father to me. I couldn't work for anyone else so I hardly dare leave, even though I would like to very much at times." Such statements are clear revelations of excessive dependency.

We pointed out that he never mentioned his wife and child and that to get well he had to follow three steps in his thinking every hour of the day. (1) Remember the reason for symptoms. (2) Relinquish mental self care. (3) Do something for or with other people.

This simple formula in most cases brings about the redistribution of emotional energy so necessary in a psychoneurosis or psychosomatic condition. The drive for superiority seen in many patients usually dissolves into moderation when the patient accepts his passivity and dependence. The patient referred to stopped work in September and one month after psychotherapy began, he went to work again and has remained there for the past two years. He plays golf with his fellow workers and goes to the baseball games and takes his wife and child on holidays and his friends tell him he is a new man.

SPACING OF APPOINTMENTS

Appointments for psychotherapy are

usually weekly and last from thirty to fifty minutes. They can be two or three times weekly and after certain cases are started off they may manage and make progress by being seen once in two weeks. Patients coming some distance may take the more widely spaced appointment of necessity. On the other hand, daily interviews are hardly expedient unless the case is ill enough to require psychoanalysis.

PROGRESS

It must be remembered that patients make progress in varying degrees. One patient may make only one-tenth of the progress another will make, but that progress is important to him and his family.

With each interview, keep a note, at least a mental one, if you can, of the directions you have given the previous visit and get the patient to describe his progress. This will lead him to discuss his difficulties and satisfactions. Recently a patient said, "I'm resolved that from now on I'm going to be less upset by my uncomfortable sensations. I know they are not going to be my undoing so I'm going to leave them alone and try to take more interest in other things." We, of course, commended her on this resolution and it was our starting point next session. The physician does not need to guide the patient too much as some are good at analyzing their own problems in an orderly way. Others tend to ramble and need more guidance. In a few, the use of dream analysis will help to understand unconscious trends, but this requires experience on the part of the physician. Much good psychotherapy can be done without dream analysis.

We like to supplement the office re-educational work with reading in many instances. This relationship of emotion to symptoms is very understandably presented in a book called "The Person in the Body" by Leland Hinsie and published by W. W. Norton. For the uninspired, self-centered person needing an inspirational book with a religious orientation, Dr. Harry Emerson Fosdick's book called "On Being a Real Person," published by Harper Brothers is excellent. Karl Menninger's "Love Against

Hate," by Harcourt, Brace and Company is wonderfully informative and can't help but make any patient more aware of the forces which work within him. For the older person, a recent book by George Lawton called, "Aging Successfully" by Columbia University Press should be read by young and old alike, whether they have an old age problem at the moment or not. Finally, for the patient who wants to be more sociable and really has a little friendliness in him, Dale Carnegie's "How To Win Friends and Influence People" by Pocket Book tells one how to proceed in a very specific way. People smile when its name is mentioned but it has an enviable sales record and that, to our mind, is because it meets a real need.

PSYCHOANALYSIS

How many patients with psychosomatic illness need the intensive psychotherapy of psychoanalysis? Not all, by any means. But surely, quite a few. Many cases of anxiety hysteria, chronic gastrointestinal symptoms, mucus colitis, migraine, certain skin manifestations and others just will not be helped enough without analysis. But this should not disturb us except for the fact that there are not enough psychoanalysts to do the needed work. There is more than enough psychotherapeutic work for all kinds of physicians to do if the patients needing psychotherapy get it.

There is most for the general practitioner to do and much for the medical and surgical specialist also. There are different degrees of severity and the general practitioner doubtless helps the largest number—the specialist who is interested in psychotherapy is next—the psychiatrist who is not an analyst is next and the psychoanalyst really treats the fewest of all because of the time element necessary. Yet many undoubtedly require psychoanalytic treatment, not to mention the research work in this field still to be carried out by the internist, physiologist, and psychoanalyst working together.

It is difficult to estimate how long some emotionally ill people need to come to terms with their real selves. After seven months

of analysis a woman said, "You have been telling me all along about my childishness but I don't think I can face it yet. I'm just getting to the point of having flashes of recognition of it. I've considered it the impossible admission to agree that I am childish." One of the outstanding problems in technic of psychotherapy is, for the physician to be satisfied with slow results. It takes people time to change and while they are desirous of having symptoms removed they have difficulty in changing rapidly. To be able to give reassurance and encouragement around this point will help to keep both patient and doctor from becoming annoyed with each other and with the psychotherapeutic treatment of an illness which, (1) had a long history of development and (2) necessitates that the patient concern himself with his emotional relation to life and people over a fairly long period of time if not indefinitely.

So we see that management of the emotional factor in disease is not easy but it is very satisfying to those who like to work with the personalities of people and help them lead more constructive and enjoyable lives, as well as free them from bodily distress.

DISSEMINATED CRYPTOCOCCUS NEOFORMANS

CASE REPORT

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NEW ORLEANS

This report is not intended to be a review of the literature, but is presented solely to illustrate the difficulty in making a correct diagnosis early in the course of the disease and to present a therapeutic agent of possible value.

"Cryptococcosis is a subacute or chronic infection, caused by *Cryptococcus neoformans* (*Torula histolytica*), which may involve the lungs, skin or other parts of the body, but has a marked predilection for the brain and meninges." *Cryptococcus*

Medical Department of Touro Infirmary, New Orleans, La.

affects all ages, but more often is seen in those between 40 and 60 years. Ratio of males to females is less than 2 to 1. All races are equally susceptible.

MYCOLOGY

Cryptococcosis is not transmitted from man to man. The mode of transmission is unknown. Its appearance in sputum, tissue, or exudate is that of a spherical, thick walled, budding organism surrounded by wide capsules.

SYMPTOMATOLOGY

The fungus usually enters the body via the respiratory tract. However, it may enter through the skin, nasopharyngeal mucosa, and occasionally through the intestinal tract.

PULMONARY FINDINGS

The pulmonary findings are not diagnostic. The patient presents the picture of a subacute infection with low grade fever and a mild cough. Sputum may or may not be present. Distribution may be anywhere in the lungs. Physical signs most frequently present are dullness and altered breath sounds. Rales are inconstant except in patients with terminal miliary dissemination in the lungs.

CENTRAL NERVOUS SYSTEM FINDINGS

Signs and symptoms appear gradually and consist of intermittent headache, which is usually frontal, vomiting, dizziness, vertigo, stiffness and pain in the back of the neck. The onset may occasionally be sudden and violent.

The physical signs are those of any chronic meningitis. Amblyopia is usually seen. Other signs occasionally seen are strabismus, nystagmus, ptosis, diplopia, ataxia, and hemiplegia. Neuroretinitis and papilloedema are usually present.

The course may be that of a progressive weight loss, weakness, anorexia, and finally the patient becomes comatose and dies of respiratory failure or intercurrent infection.¹

CASE REPORT

Mrs. L. S., a 58 year old American-born housewife, who was admitted to a private medical

service, Touro Infirmary, on July 17, 1948 with a chief complaint of vomiting, and pain in the occipital region. The onset of the present illness coincided with the death of the patient's mother-in-law, to whom she was quite attached. In July 1947, she became depressed, neglected her household duties, complained of anorexia and had periodic bouts of nausea and vomiting. In January 1948, the vomiting had become more severe. In early July, shortly before admission, she began to complain of headache, which remained constant until admission. She had lost 30 pounds since the onset of her illness. She denied having had fever, cough, hemoptysis, jaundice, hematemesis, or melena. Past history was noncontributory except for a nasal operation in 1912, following which she had almost total bilateral deafness, and in 1928 she had "typhoid malaria". Family history noncontributory.

Physical examination revealed an apathetic white female, moderately well developed and nourished, who did not appear acutely ill. Temperature 101° F., pulse 90 per minute, respiration 20, B. P. 128/62. No gross abnormalities were detected on physical examination. Neurological examination, except for bilateral conduction deafness, was entirely negative.

The clinical diagnoses considered at this time were psychosis, brain tumor, and carcinoma of the stomach.

Laboratory findings on admission: RBC 4,600,000; Hb. 14.4 gms.; WBC 8,000; 68 per cent polys, 31 per cent lymphocytes, 1 per cent eosinophiles. Urinalysis: specific gravity 1.028, albumin and sugar negative. Catheterized specimen of urine revealed innumerable gram negative bacilli on the stained sediment. Serology was negative. Blood NPN, 44 mg. per cent, blood sugar 100 mg. per cent. Febrile agglutinations, malaria smear, sputum concentrations, blood culture, and stool examinations were negative. X-ray of the chest was negative except for irregular calcific deposits in both upper lobe areas. Gastrointestinal series negative except for a very small hiatus hernia. A barium enema was negative. Retrograde pyelograms were negative.

Clinical Course: The patient's headache disappeared spontaneously on the second hospital day, and did not recur during the entire period of hospitalization. On supportive therapy, consisting of parenteral fluids and sedation, the nausea and vomiting diminished, but never subsided completely. The temperature curve was septic in type, ranging between 99° and 103° F. On the seventh hospital day, after what was considered to be an adequate study, "triple sulfa" (sulfadiazine, sulfamerazine, and sulfathiazole) was started empirically, 1 gram every four hours. After six days of this medication, there had been no improvement. The drug was discontinued and crystalline penicillin, 100,000

¹Manual of Clinical Mycology National Research Council.

units every three hours was given intramuscularly and continued for a total of 5,600,000 units.

On the twentieth hospital day, the patient was transferred to the public ward, where most of the laboratory work was repeated. In addition, a lumbar puncture was done. The spinal fluid was crystal clear, under no increased pressure, and the dynamics were normal. The cell count was 0, Pandey—slight trace, colloidal gold curve 1111110000, protein 80 mg. per cent; chlorides 614 mg. per cent; glucose 35 mg. per cent. Direct smear was negative for acid fast organisms. A tentative diagnosis of tuberculous meningitis was made, and lumbar puncture was repeated the following day to obtain material for animal inoculation. The repeat puncture revealed chemical findings identical with the above ones. In addition, the cell count was 3 polys, 27 lymphocytes and 29 yeast-like organisms, which on culture proved to be *Cryptococcus neoformans*. At his time, the blood culture was positive for the same organisms. Sputum specimen was unobtainable; urine culture was negative; yeastlike organisms were grown from the stool, but were never positively identified as cryptococcus. Proctoscopic examination at this time was negative.

As the patient had lost considerable ground since admission, the prognosis was critical. Review of the current literature revealed approximately 75 cases of systemic cryptococcal infection, all of which ended fatally. Various therapeutic agents were considered. Adequate dosage of sulfa and penicillin had been used earlier in the course of the illness, without clinical improvement. Iodides had received some favorable mention, but a determination of patient sensitivity to the isolated organism is advisable before therapeutic iodides can be administered. Repeated attempts to make an antigen from the isolated *Cryptococcus neoformans* were unsuccessful because of technical difficulties and consequently this therapy was abandoned.

In vivo studies were then carried out. Promin was selected first, and growth of the organism was inhibited slightly by a concentration of 0.4 per cent. In spite of the extremely high concentration, required, no better therapeutic agent was available, and intravenous promin was given from the twenty-sixth to the thirty-eighth hospital day, total dosage 171 grams. A moderate anemia developed, which responded to transfusion of whole blood. The spinal fluid and blood cultures remained positive, and as there had been a steady downhill course, this therapy was discontinued.

At this time, a supply of Actidione (Upjohn) was received and in vitro growth of the organism was completely inhibited by a concentration of

1:100,000. Therapy was started 20 mg., intramuscularly, daily on the fortieth hospital day and on the forty-second day the dosage was doubled. After the third day of treatment the temperature remained below 100° except on two occasions when it reached 100°. Clinically the patient showed some improvement, her appetite increased, she became less irrational, though nausea and vomiting persisted. The blood picture and urine were unaffected by this drug. After eleven days of therapy her fever rose to 100.4°, but returned to normal within twenty-four hours. However, from this point onward, she deteriorated rapidly and expired on the sixtieth hospital day, September 11, 1948.

Autopsy findings: The brain, spinal cord, meninges, pericardium, kidneys, adrenals, and lungs revealed diffuse involvement by *Cryptococcus neoformans*. Blood and spinal fluid cultures taken at the time of autopsy were positive for *Cryptococcus neoformans*. The immediate cause of death was bronchopneumonia.

COMMENT

No idea can be given as to the portal of entry or duration of the infection in this patient. She dated her illness from a severe emotional trauma, and for one year, both she and her family believed this to be the sole cause of her illness. When she sought medical aid, a complete and thorough examination revealed no specific diagnosis. Except for the septic temperature curve, no further diagnostic work would have been done, and the final diagnosis would have been psychoneurosis. It is interesting to note that the first blood culture and first spinal fluid studies did not reveal the offending organism. The chemical findings in the spinal fluid, namely, a decreased chloride and sugar, with an elevated protein, are typical of both meningoencephalitis due to *Cryptococcus neoformans* and tuberculous meningitis. On the second spinal fluid studies the organisms were confused with lymphocytes, and it was not until budding forms were seen that the correct diagnosis was made. Many cases of cryptococcosis are overlooked because of the bizarre clinical picture resulting from such a widely disseminated disease, and the true nature of the disease is not recognized until postmortem examination. It is suggested that spinal fluid studies be done in all cases of fever in which the cause is obscure.

A COMPARATIVE STUDY OF LOFFLER'S AND WEINGARTEN'S SYNDROMES*

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BATON ROUGE
PREFACE

"Die flüchtigen Lungeninfiltrate mit Eosinophilia"

Von W. Löffler¹⁸

Das *Hauptsymptom*, der Röntgenschat-
ten, ist von beliebiger Lokalisation und be-
liebiger Ausdehnung, variabler Struktur,
homogen oder häufiger fleckig oder wal-
kig, schärfer oder weniger scharf be-
grenzt, einfach oder multipel, unilateral
oder bilateral."

The main symptom, the x-ray shadow is
of indefinite localization and indefinite
spread, of variable structure, homogenous
or more often flecked (patchy) or cloudy,
more or less sharply defined, single or mul-
tiple, unilateral or bilateral.

"Das Hauptkriterium des Schattens ist
seine Flüchtigkeit, . . ."

The main criterion is the transitory char-
acter of the shadows.

"Das 2. *Hauptsymptom*, bildet also die
Eosinophilie im Blute. Sie geht von mäs-
sigen Graden zu sehr hohen Werten; der
höckste Wert, den wir beobachteten er-
reicht 66% bei 14300 Weissen, . . . Die
Eosinophilie ist in der Regel, das muss
besonders betont werden, eine Begleiter-
scheinung der Infiltrate, eine Para-, nicht
eine Meta-Erscheinung, wenn auch das
Maximum der Eosinophilie oft etwas
später eintritt als das Maximum der
Schattenbildung. Es handelt sich jeden-
falls nicht um eine "postinfektiöse"
Eosinophilie."

The second main symptom, arises from
the blood eosinophilia. It ranges from a
moderate grade to high values; the highest
values which we observed reached 66 per
cent with a white count of 14,300 . . . The
eosinophilia is as a rule, as must especially
be emphasized, an accompaniment of the
infiltration, a *para* not a *meta* appearance,
although the maximum eosinophilia often
appears somewhat later than the maximum
x-ray shadows. It is not related to a post
infectious eosinophilia.

*Walter Reed Memorial Award, Louisiana State
University Medical School 1948.

"Durch die 3 erwähnten Hauptsymptome:

1. eines Röntgenschat-
tens in Lungenfeld,
2. den Nachweis seiner Flüchtigkeit und
3. der begleitenden Bluteosinophilie ist
der Symptomenkomplex im wesentlichen
gekennzeichnet. Es kommt dazu ein
viertes, nicht unwesentliches *klinisches*
Kriterium, Nämlich, der auffallende
Symptom-komplex wird von nur *gering-
fügigen Störungen des Allgemeinbefindens*
begleitet. Von unseren 51 Beobachtungen
sind 14 bei Reihendurchleuchtungen oder
Umgebungsuntersuchungen g e f u n d e n
worden also bei Leuten, die nicht ihrer
Beschwerden wegen zur Durchleuchtung
gekommen sind."

Through the aforementioned three main
symptoms, (1) an x-ray shadow in the lung
field; (2) the recognition of its transi-
ency; (3) the accompanying blood eosino-
philia, the symptom complex is (es-
sentially) recognized. There is in addi-
tion a fourth not unessential clinical cri-
terion, namely: this striking symptom com-
plex is accompanied by only insignificant
disturbances of the general (physical?)
condition. Only 14 per cent of the 51 cases
had been ill enough to be x-rayed.

INTRODUCTION

In the years since the development of the
microscope, internists have reported a
variety of diseases characterized by eosino-
philia. A significant number of these ill-
nesses were associated with symptoms and
signs of pulmonary involvement. As x-ray
came into general use these clinical find-
ings were confirmed by the films; at about
the same time, entomologists suggested
that several of the metazoon organisms
were the etiological agents. Too often, un-
fortunately, these agents could not be
demonstrated and unrelated diseases like
Hodgkin's disease, peri-arthritis nodosum,
scarlet fever, leukemia, malignancy (meta-
static),¹⁵ Simmond's disease, fungus infec-
tions, benzol poisoning, raw liver diet, and
splenectomy,¹⁵ were found to produce sim-
ilar symptoms. It was not until the hy-
pothesis of sensitivity was propounded that
a common denominator could be found. Ac-
cording to the allergists,⁹ the eosinophilia
and pulmonary condition was on an aller-
gic⁸ basis. However, in spite of the hypoth-
esis, there was little correlation between

the findings and therapy, because of the wide variability in the signs.

In 1932¹⁹ and again in 1936¹⁸ Löffler made the first significant break in the general pattern noted above. He drew attention to the special condition of a "transitory infiltration of the lung with eosinophilia"^{10, 21} in 51 patients from a tuberculosis clinic in Switzerland. Subsequently, more than 100 patients have been reported in the literature and discussed by other writers.

In 1934, R. J. Weingarten, the principal medical officer of Bikaner State, India, reported a disease entity found in 81 of his patients which he called "Tropical Eosinophilia." This symptom complex, like Löffler's syndrome, was characterized by infiltration of the lung with eosinophilia. Weingarten, while he was aware of Löffler's work, apparently had not read Löffler's original articles but rather Freund and Samuelson's summary, and so did not recognize the close similarity of the syndrome that he was reporting and Löffler's "Type E" complex. He considered that his syndrome was a new disease entity and that "There is no connection between the disease and . . . (that) described by Löffler."²⁷ Subsequently, other writers have continued to treat these as two separate complexes, while some have argued that they are expressions of the same syndrome. The purpose of this paper is to examine the evidence and attempt to differentiate or clarify this misunderstanding.

Before an analysis, a description of the sequence and development of the illnesses as reported by Löffler and Weingarten is in order.

Löffler¹⁸ reports that: The patient's illness begins with an evanescent sense of malaise which is so moderate as to cause few patients to become bedridden, as indeed is the whole illness. After a few days, the patient or his family may notice a sense of moodiness which tends to disappear. This is followed by a minimal increase in temperature accompanied by a frequent irritative cough of increasing intensity (without pleurisy); there may be an at-

tendant wheezing. The cough is relatively nonproductive but may bring up a thin, slimy brassy tasting sputum which contains few cells (those present being eosinophilic). Occasionally, there is spotting of blood in the sputum. After four to five days of mild pneumonic symptoms, consisting of an occasional mild friction rub, crepitant râles, vesicular breath sounds, and absent or minimal dullness, the patient begins to improve. In a few days to two weeks all symptoms are gone in a majority of cases. In a few cases the condition may become chronic. During the period of pulmonary symptoms, transitory x-ray shadows in the lung fields seemingly of much greater seriousness than the symptoms and signs imply, are noted. Serial films will show fluctuation in the place, density, and number of infiltrations. As the x-ray and clinical symptoms regress, an increasing blood eosinophilia develops up to 66 per cent.

Weingarten²⁷ reports that: The disease begins with lassitude, fever rising as a rule to 100° F. or 101° F. in the evening. During this hyperpyrexia period the spleen tends to become moderately enlarged 3 to 5 cms. below the costal margin and is hard, smooth, and nontender. There is loss of appetite, and usually an appreciable loss of weight within a short time.

About seven days later a dry, hacking, ineffective cough develops (productive of scanty, tenacious, and glassy sputum, containing clumps of eosinophils), which is worse at night and which interrupts the patient's sleep paroxysmally, often being accompanied by severe wheezing. (On the second week of this period of pulmonary symptoms, a disseminated mottling of both lungs develops which tends to disappear in about four weeks.) The expiratory wheezing which develops may persist between the paroxysms of coughing. This persists for weeks, some cases developing a typical early morning bronchial asthma (except that the restlessness, suffocation and anxiety are not as alarming as in pure asthma). During the day the patient is free of coughing and breathlessness.

Gradually the temperature becomes sub-

febrile and the weakness and weight loss decrease. The eosinophilia, which tends to be high (up to 88 per cent), gradually reduces, but, unless the disease is treated, the asthmatic attacks become chronic.

THE ANALYSIS

The following is a parallel analysis of the two complexes based on a study of the epidemiology, symptomatology, laboratory and roentgenological findings, pathological picture, etiology, and therapeutic technics.

EPIDEMIOLOGICAL ASPECTS

LÖFFLER'S SYNDROME

Geographical Distribution:

Switzerland.
France.
Palestine.
Holland.
Germany.
Belgium.
Norway.
Denmark.
Sweden.
China.
United States (?)
Japan (?)

WEINGARTEN'S SYNDROME

Geographical Distribution:

India.
Ceylon.
Netherlands East Indies.
Australia.
Samoa.
Egypt.
Tanganyika.
Brazil.
Panama.
Netherlands West Indies.
Trinidad.
Columbia.
British Honduras.

(?) The cases reported in these areas are more typical of Weingarten's syndrome but were called Löffler's Syndrome.

Climate: Predominantly in dry climates.¹

Season: Predominantly in August and September but seen in all months.¹⁸

Altitude: Predominantly in highland areas.¹⁸

Race: Predominantly Caucasian.¹

Social Status: All levels.¹⁸

Family Incidence: More than one member of the family may have the disease but this is not common.¹⁸

Sex Incidence: M/F 3 to 2.¹⁸

Age Incidence: At any age, but mainly in the middle years of life.¹⁸

Coexistent Allergy: Moderately common.¹¹

Climate: Predominantly of humid climates.²⁷

Season: No special season.

Altitude: Predominantly in lowlands and swampy areas.²⁷

Race: Predominantly in dark races but found in all races.¹

Social Status: All levels.¹⁸

Family Incidence: More than one member of the family may have the disease, but this is not common.²⁷

Sex Incidence: M/F 1 to 1 to 1 to 2.²⁷

Age Incidence: At any age, but mainly in the middle years of life.²⁷

Coexistent Allergy: Rare.¹⁷

SYMPTOMS AND SIGNS

LÖFFLER'S SYNDROME

*Prodromal Symptoms and Signs*¹⁸

- A. Evanescent, moderate malaise.
- B. Sense of moodiness.
- C. Normal to mild rise in temperature.
- D. Little or no loss of appetite.
- E. Little or no loss of weight.
- F. No splenic enlargement.
- G. History of previous disorders in a few cases.

*Dromal Symptoms and Signs*¹⁸

A. Developing, relatively nonproductive, irritative cough after two to three days.

B. A slight amount of thin, slimy sputum with occasional eosinophils and on rare occasions spotting of blood.

WEINGARTEN'S SYNDROME

*Prodromal Symptoms and Signs*²⁷

- A. Generalized lassitude.
- B. _____
- C. Evening rise in temperature to 101°F.
- D. Loss of appetite.
- E. Rapid, appreciable loss of weight.
- F. Moderate enlargement of the spleen which is hard, smooth, and nontender.
- G. History of previous pulmonary disorders in many cases.

*Dromal Symptoms and Signs*²⁷

A. Developing, dry, hacking ineffective cough; worse at night; paroxysmal during first two weeks.

B. A scanty, tenacious, glassy sputum with clumps of eosinophils; occasionally find secondary invasions of bacteria; occasionally find mucopus.

- C. Bronchial asthma in 5 to 8 per cent of the cases.
- D. Occasional mild friction rub.
- E. Occasional circumscribed areas of pleural fluid.
- F. Transient areas of dullness over the areas of pulmonary infiltration.
- G. Exaggerated vesicular breath sounds, crepitant râles around areas of pulmonary infiltration.
- H. _____
- I. The symptoms and signs listed above rapidly disappear in from five days to two weeks, with most patients never having visited the doctor.

*Postdromal Symptoms*¹⁸

- A. Most recognized cases become symptom free without medication.
- B. A few cases become chronic and require therapy.

- C. Expiratory dyspnea and wheezing with cough; early morning bronchial asthma, which disappears during the daytime; prolonged wheezing.
- D. _____
- E. _____
- F. Occasional dullness; usually pulmonary hyperresonance over the areas of pulmonary infiltration.
- G. Sibilant and sonorous rhonchi with occasional nonresonant râles over the lung bases.
- H. The temperature, weight loss, cough, and dyspnea decrease gradually.
- I. The symptoms and signs slowly disappear in from 4 weeks to several months; with most of these patients having required hospitalization and/or doctor's aid.

*Postdromal Symptoms*²⁷

- A. Few cases become symptom-free without medication.
- B. All cases become chronic unless treated.

LABORATORY FINDINGS

LÖFFLER'S SYNDROME

Sputum

- A. Eosinophils in small numbers present.¹⁸
- B. _____
- C. _____
- D. Bacteria and pus rarely seen.¹⁸
- E. _____

Blood

- A. RBC: Normal findings to slight anemia.¹⁸
- B. WBC: Early and continued leukocytosis up to 15,000/cmm.¹⁸
- C. Polymorphonuclear leukocytes: a shift to the left of 6-7 per cent.¹⁸
- D. Eosinophils: Eosinophilia up to 66 per cent but usually of 10 to 20 per cent.^{19,3}
- E. Sedimentation Rate: Normal to 50mm/hr fall.¹⁸
- F. Ratio of neutrophils and lymphocytes usually normal.¹⁸
- G. _____

Urine

Findings negative.

Feces

- A. Löffler found no ascaris ova.¹⁸
- B. Other writers have reported various cysts, ova, and parasites.²⁸

Other Special Tests

- A. Wassermann: Negative.¹⁰
- B. _____
- C. _____
- D. Tuberculin: Occasionally positive.¹⁸
- E. _____

WEINGARTEN'S SYNDROME

Sputum

- A. Eosinophils in clumps present.²⁷
- B. Occasionally Charcot-Leyden crystals present.²⁷
- C. Occasionally Curshmann spirals present.²⁷
- D. Occasionally bacteria and muco-pus present. After secondary involvement, pus always present.
- E. Mites (tyroglyphus, carpoglyphus, glyciophagus, or tarsonemus) commonly found in sputum.^{5, 24}

Blood

- A. RBC: Normal findings to slight anemia.²⁷
- B. WBC: Early and often continued leukocytosis up to 75,000/cmm. Later, occasionally get leukopenia.
- C. Polymorphonuclear leukocytes: adult forms, no shift.²⁷
- D. Eosinophils: Eosinophilia up to 88 per cent (mature type) but usually of 10-40 per cent.^{27, 3}
- E. Sedimentation Rate: Moderate acceleration.²⁷
- F. Ratio of neutrophils and lymphocytes usually normal.²⁷
- G. Microfilaria: Usually negative.²⁴

Urine

Findings negative.

Feces

- A. Weingarten did not report fecal studies.²⁷
- B. Other writers have reported various cysts, ova, and parasites.¹⁶

Other Special Tests

- A. Wassermann: Positive.⁶
- B. "Kahn": Negative or doubtfully positive.⁶
- C. Proteus 0x19 and 0xK: Negative.⁶
- D. Tuberculin: Rarely positive.²⁷
- E. Histamine: Positive in 12.5 per cent.¹⁷

F. _____	F. Insulin: Occasionally produces a positive eosinophil reaction without lung involvement. ³¹
G. Ascaris extract: Positive in 70 per cent ³¹	G. _____
H. <i>E. histolytica</i> extract: Occasionally positive. ^{29, 13}	H. _____
I. <i>Trichinella spiralis</i> extract: Occasionally positive. ²⁹	I. _____
J. Necator extract: Occasionally positive. ²⁹	J. _____
K. Strongyloides extract: Occasionally positive. ^{24, 29}	K. _____
L. _____	L. Microfilaria skin test: Occasionally positive. ^{24, 14, 22}
M. Tests for Brucella: Occasionally positive. ²⁸	M. _____
N. Tests for <i>A. braziliense</i> : Occasionally positive. ^{29, 30}	N. Tests for <i>A. braziliense</i> : Occasionally positive. ^{29, 30}
O. Coccidioidomycosis extract: Occasionally positive. ²⁸	O. _____
P. _____	P. Cold agglutinins: Positive in 80 to 90 per cent. ²⁵
Q. <i>Monilia albicans</i> culture: Occasionally positive. ²	Q. _____
R. <i>Fasciola hepatica</i> extract: Occasionally positive. ²⁸	R. _____

ROENTGENOLOGICAL FINDINGS

LÖFFLER'S SYNDROME¹⁸

- A. Transitory shadows on x-ray plate "in any portion and of any size, of variable structure, homogeneous, or more frequently patchy or cloudy, more or less sharply circumscribed, single or multiple, unilateral or bilateral," of five types:
1. Large, irregular shadows in one or both lungs.
 2. Small, round bodies or flocculations in one or both lungs.
 3. Multiple or pleuracentric shadows, unilateral or bilateral.
 4. Lobular infiltrations.
 5. Secondary tuberculous-like infiltrations, unilateral or bilateral, apical.
- B. Rapid appearance and disappearance of the shadows in the same area as previously seen.
- C. Shadows are parenchymal, not hilar.
- D. _____

WEINGARTEN'S SYNDROME²⁷

- A. Transitory, disseminated mottlings of both lungs often patchy in character which appear to follow the branches of the bronchial tree and alveoli, tending to be basal.
- B. Gradual appearance and disappearance of shadows over a period of four to six weeks.
- C. Shadows are more numerous at hilar regions and in the bases and along the branches of the bronchial tree.
- D. Chronic cases show permanent bronchial markings.

GROSS PATHOLOGICAL PICTURE

LÖFFLER'S SYNDROME

- Brain: _____
- Mesentery: _____
- Lungs:
- A. Recent adhesions of visceral and parietal pleura.²
- B. Serosanguinous fluid in the pleural cavities (500 cc.²)
- C. Multiple grayish yellow, firm, irregularly formed regions of variable size and shape of increased density in the lungs with overlying thickened pleura.²

WEINGARTEN'S SYNDROME

- Brain: Punctate hemorrhages in white and gray matter.²⁶
- Mesentery: A few areas of hemorrhage.²⁶
- Lungs:
- A. Recent adhesion of lung to chest wall.²⁶
- B. No fluid in either pleural cavity.²⁶
- C. Multiple dark reddish brown (firm?), irregularly shaped regions of variable size and shape in the lungs looking like early infarctions.²⁶

- D. On cut surface, multiple grayish yellow, firm nodular regions varying in size from a few mm. to 5.0 cm.²
- E. Mucous secretions in the bronchi with thickened walls and alveolar dilatations in the upper lobes.²
- F. ————
- G. Basal bronchopneumonia.²

- D. On cut surface, multiple, dark reddish-brown, non-consolidated, hemorrhagic areas, varying in size from 0.5 to 3 cm.²⁶
- E. Blood stained muco-purulent secretions in the bronchioles; congested bronchiolar mucous membranes.²⁶
- F. Lungs nonsinkable in water.²⁶
- G. Areas of bronchopneumonia.²⁶

MICROSCOPIC PATHOLOGICAL PICTURE

LÖFFLER'S SYNDROME

Brain:

Lung:

A. Areas of interstitial fibroblastic and collagenous proliferation in the parenchyma of the lungs. In the meshes of collagenous fibers are large numbers of eosinophils, plasma cells, lymphocytes, and some giant cells.

B. The lumina of the alveoli contain serum, red cells, fibrin, eosinophils, plasma cells, lymphocytes and giant cells. Partially organized areas of interstitial pneumonia closely related to thickened alveolar walls which show cellular exudates of large eosinophilic, plasma, and lymphocytic cells.

C. ————

D. Peribronchiolar and perialveolar tubercule-like nodules consisting of central eosinophilic, granular, necrotic material mixed with mononuclear fibroblastic and multinucleated giant cells surrounded radially by large histiocytes, epithelioid and fibroblastic cells. Around this is a zone of eosinophil, plasma, and lymphocytic cells.

E. Areas of recent hemorrhage with marked capillary dilatation and thickened arterial and arteriolar walls. Occasional vascular necrosis. Severe periarterial and pericapillary inflammation with eosinophils and plasma cells as the principal elements (like periarteritis nodosum).

F. Moderate hyalinization of the bronchiolar basement membrane.

ETIOLOGY OF LÖFFLER'S SYNDROME

The etiology of Löffler's syndrome is obscure. Löffler became cognizant of the problem while working with tuberculous patients and, at first, thought it was a mild, atypical form.⁷ Later, he and others excluded this as a causal factor.¹¹

Engel, in China,⁷ observed a seasonal fluctuation in the occurrence of the syndrome and demonstrated that it coincided with the flowering of the privet plant.

WEINGARTEN'S SYNDROME

Brain: Congested areas of perivascular mononuclear cell infiltration.²⁶

Lung:

A. Areas of interstitial fibroblastic proliferation in the parenchyma of the lungs. In this process is cellular infiltration with eosinophils and monocytes.

B. Alveoli lined with swollen cells, the lumina of which are partly or completely filled with macrophages and phagocytic monocytes, some of which contain anthracotic, hemosideritic or eosinophilic granules grouped in one part of the cellular cytoplasm. Occasional alveolar giant cells with 15 to 25 nuclei gathered together in the center of the cell; partially consolidated areas of interstitial pneumonia closely related to the terminal alveoli made up of infiltrations of eosinophils and monocytes.

C. Large number of interalveolar cells and containing eosinophilic granules.

D. Peribronchiolar nodules characteristically consisting of 4 to 5 centrally located multi-nucleated giant cells surrounded by clusters of monocytes. (The giant cells are not like tuberculosis but more like rheumatic fever giant cells.)

E. Areas of recent hemorrhage with marked engorgement of the interalveolar capillaries.

F. ————

Following this lead, other European writers reported a variety of allergic phenomena which were expressed, whether before, or at the time of, the pulmonary eosinophilia.^{1, 7, 12, 31} Löffler himself, had discussed the highly seasonal character of the syndrome, though he reported some cases throughout the year.^{18, 19}

Löffler and other Swiss writers pointed out the close association of the syndrome with *Ascaris* infection.^{10, 18, 19} Zweekel³¹

found that 70 per cent of his cases were sensitive to ascaris extract as against 40 per cent in the general population.

Koino,⁷ in Japan, demonstrated one mechanism for the production of the syndrome by swallowing 2,000 embryonated eggs of ascaris with a resulting pneumonia. In spite of Koino's experimental evidence, the European writers generally agreed that the syndrome represented an allergic reaction. They concluded that the shock organ was the interstitial tissue of the lungs sensitized to a special allergen. Gravesen¹¹ pointed out that the fact of the interstitial hypersensitivity differentiates Löffler's syndrome from bronchial asthma and that this differentiation should be made.

But, ascaris is not the only sensitizing organism, as is demonstrated by the many agents recorded in the "Special Tests" listed above. Therefore, if Löffler's syndrome is due to a special tissue sensitivity, it must be assumed that there is a nonspecific allergen to be found in common in all the diverse agents recorded above.

At the present time, *Löffler's syndrome is assumed to be a special sensitivity, with the interstitial tissue of the lungs acting as the shock organ, to a nonspecific allergen elucidated by a wide variety of organisms.*

ETIOLOGY OF WEINGARTEN'S SYNDROME

Weingarten was unable to determine the etiology of "Tropical Eosinophilia", and though he considered filaria, he discarded it because it could not be demonstrated. His early treatment was, as a result, symptomatic and empirical.

The current theories of causation for "Tropical Eosinophilia" are:

1. *The Allergen Theory*: Frimodtmøller and Barton,¹⁶ Weingarten²⁷ and others postulated an allergic basis for the syndrome because of the asthmatic and eosinophilic features. Prior to the discovery of a specific therapy, all treatment was based on this hypothesis. There are, however, certain objections to it:

- a. the leukocytosis.
- b. the severe constitutional symptoms.
- c. the poor response to the usual anti-allergic medications.

d. the specific reaction to arsenicals.

e. the lack of success in finding an allergic history in most cases.

2. *The Histamine Theory*: Alexander¹⁶ is reported to have described an "intrinsic asthma" characterized by chronicity, remissions, absence of allergic history, and a leukocytosis with eosinophilia which he postulates is due to a "histamine-like" substance. Jhatakia¹⁶ suggests that "intrinsic asthma" and "tropical eosinophilia" are in all probability the same syndrome.

The chief objections to this theory are:

a. No one has demonstrated this "histamine-like" substance.

b. Joseph¹⁷ was able to demonstrate that only 12.5 per cent of his patients gave a positive reaction to histamine.

3. *The Parasitic Theory*: de Langen,²⁴ Meyers and Kouwenaeer,²⁴ Carter, Wedd and D'Abrera,⁵ and others have demonstrated a variety of organisms which produce "Tropical Eosinophilia" ranging from Strongyloides and filaria to mites. Of these, a majority of the cases have been demonstrated to be due to the latter and Carter and D'Abrera⁴ have demonstrated experimentally, in monkeys, the mechanism by which mites produce this syndrome.

4. *The Spirochetal Theory*: A number of writers^{5, 17} have postulated a pulmonary spirochetal infection as a causative agent for "Tropical Eosinophilia." Certain evidence supports this contention:

a. the specific response to arsenicals.

b. the occasional demonstration of spirochetes in the sputum.

c. the high incidence of positive Wassermanns.

d. the fever, glandular enlargement, cough, leukocytosis and eosinophilia all of which are common findings in spirochetal infections.

The objections to this theory are:

a. the difficulty of consistently demonstrating spirochetes.

b. the asthmatic reaction is not found in spirochetal infections.

c. spirochetes are not found in the blood.

d. antimony, bismuth, and other anti-

spirochetal drugs do not relieve this symptom.

e. sulfa drugs and penicillin give poor response.

5. *The Virus Theory*: Viswenathen and Natarajan²⁵ reported a positive response in high titre to cold agglutination tests in between 80 to 90 per cent of their cases. It has been postulated that the best explanation of the multiplicity of casual agents would be on the basis of a virus infection. Evidence for this is:

a. many virus diseases produce eosinophilia and attendant pulmonary reactions.

b. guinea pig inoculation²⁰ with small amounts of human blood gave some support to the theory of a virus infection.

c. the pulmonary reaction is similar to atypical virus pneumonia.

The evidence against a virus infection is:

a. there is no immunity.

b. the incubation period is too long.

c. no one has demonstrated inclusion bodies.

d. no one has demonstrated the virus itself either directly or by inoculation after filter passage.

At the present time there is insufficient evidence to establish a specific causal agent for this syndrome but the best evidence favors a mite infection of the lung, with or without an accompanying allergic reaction.

THERAPY OF LOFFLER'S SYNDROME

Löffler¹⁸ reported no specific therapy for his syndrome because of the general benignity of the syndrome and its short duration. Other writers have treated the underlying infestations. Gravesen¹¹ desensitized his patient with specific autogenous vaccines. In the occasional case showing secondary asthmatic symptoms antispasmodics and sympathicomimetic drugs have been used. But specifically, *at the present time*, it can only be said that *there is no specific therapy for Löffler's syndrome*.

THERAPY OF WEINGARTEN'S SYNDROME

Many forms of therapy have been tried in treating this syndrome. Weingarten²⁷ originally used ephedrine, adrenalin, potassium iodide, ammonium chloride, codeine,

and various vitamins, all of which proved of temporary but of no permanent value. Nonspecific protein therapy proved to be useless.

In 1936, by accident, he discovered that intravenous arsenicals were specific. Since that time, oral and muscular as well as intravenous arsenicals have proved to be absolutely and permanently curative in all true cases of "Tropical Eosinophilia." Weingarten advises the following course of treatment:

a. On the first day give 0.15 grams of neoarsphenamine dissolved in 10 cc. of a 10 per cent solution of calcium gluconate to which 200 mg. of vitamin C is added.

b. On the fourth day give 0.30 grams of neoarsphenamine as above.

c. On the eighth, twelfth, sixteenth, and twentieth day give 0.45 grams of neoarsphenamine as above.

A "Herxheimer-like" reaction is seen in most cases which is characterized by an increase in the pulmonary and pyrexia symptoms during the period of the first two or three injections, after which the symptoms rapidly and permanently disappear. The eosinophilia is the last to abate, often taking several days to weeks to go.

The important point to be remembered is that arsenicals (in most of the common forms) are specific.

CONCLUSION

What is the relationship of Löffler's syndrome to that described by Weingarten? Grieg¹² Appley and Grant,¹ Sussman²³ and others⁷ have suggested that there is no true difference between the two except in degree. In support of this, they point to the fact, that clinically there is little difference between the "type E form" as described by Löffler and "Tropical Eosinophilia". It is suggested that both are allergic reactions based on a general allergen common to many organisms.

Wright and Gold³⁰ and more particularly Van der Sar,²⁴ however ask, "Why in some cases . . . the mite infection . . . (manifests) itself as Tropical Eosinophilia, in other cases as Löffler's syndrome . . . (or) without any roentgenological abnormalities

while a leukocytosis with eosinophilia persisted, must remain unanswered for the time being." Gravesen points out that it is well known to allergists that different individuals react in different degrees to any given sensitizing agent, thus explaining the question posed by Van der Sar.

In opposition to the theory that this is an allergic reaction, the Indian and Ceylonese workers contend that there is no causal relationship between these syndromes. In support of this, they point:

a. to the transitory character of Löffler's syndrome as against the chronic nature of Weingarten's syndrome.

b. to the lack of a definite etiological agent for Löffler's syndrome while they have demonstrated a specific agent, the mite.

c. to the lack of a specific therapeutic agent for Löffler's syndrome while Weingarten has demonstrated such an agent.

d. to the difficulty of explaining the specific action of arsenicals in an allergic condition.

e. to the fact that all reported cases of "Tropical Eosinophilia" fulfilling Weingarten's requisites have been acquired in tropical and sub-tropical areas, while persons with Löffler's syndrome are found only in temperate zones.

The writer is forced by the evidence of his analysis to agree with the latter school of thought, though there is still insufficient evidence to prove either point of view conclusively. At the present time, therefore, it must be concluded, that *two clinically similar syndromes have been described which require diagnostic differentiation because of the morbidity and mortality in the one case and the transiency in the other and as a result of this differentiation the seriously crippling disease may be treated with absolute specificity.*

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LEPROSY IN ITS RELATION TO THE PRACTICING PHYSICIAN

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A new orientation on the part of public health authorities in relation to the management of leprosy will necessitate a new attitude on the part of the practicing physician. Until very recently the health officer usually thought only of removing all patients from the possibility of association with other persons; now he is beginning to discriminate and aims to isolate only cases regarded as a menace, an attitude long ago adopted in some other countries and in parts of the United States. The practicing physician generally has avoided treating cases of leprosy for several reasons; first, he too often has shared the unreasonable attitude of the public who regard this disease always as loathsome and incurable; then he has known that therapy offered little or nothing; finally, he has felt that his usefulness to the community would be impaired since other patients might tend to avoid him and his office if it became known that he treated cases of leprosy. A few physicians in endemic areas and a few dermatologic specialists elsewhere have undertaken the treatment of these patients in the same manner as they treat other diseases. There is no reason why a physician should not care for leprosy patients as freely as he does those suffering from tuberculosis or syphilis, though in general, more precautions are needed with these other diseases.

BASIS FOR NEW ATTITUDE

The new attitude of health officers in general is based on the recognition of certain now reasonably well established facts, as follows: (1) Leprosy in the United States is a public health problem of material importance only in Louisiana, Texas, and Florida, and to a much less extent in California where very few infections are acquired. (2) Even in areas in which the disease tends to be transmitted, many cases are of clinical types (neural, including the

tuberculoid subtype) that rarely, if ever, serve as sources of infection. For the present we may regard as communicable all cases of the lepromatous and mixed forms, often called the nodular form. This is a decision that must be made by a physician thoroughly familiar with leprosy, and often it will best be made at the National Leprosarium at Carville, Louisiana. (3) Cases in areas in which there is definite danger of spread should be considered on an individual basis; thus, where associates of the patient are adults only, the risk is very small, while it is very important to protect children from contact with infective cases. These are the main considerations on which the new orientation is based.

Health authorities have been influenced not only by the somewhat belated recognition of these factors in relation to the measures to be taken, but also by the recognition that the usually severe, sometimes drastic, measures employed in the past have not resulted in any appreciable reduction of the prevalence of the disease. It is hoped that a more intelligent approach may result in bringing cases under medical care earlier and, in the long run, be more effective than the measures generally in use up to the present.

The practicing physician will be called on to participate in the new program mainly in the following ways:

DIAGNOSIS

1. He will be expected to be on the alert to recognize cases. In my experience, there has been too much delay in the recognition of even very clearly marked cases. This is due sometimes to the inherent difficulty in diagnosis but chiefly to the failure to suspect leprosy. In this connection, it may be stated that while clinical diagnosis often is easy, usually laboratory confirmation is necessary. This is especially true in cases of the relatively readily communicable type in which the identification of the Hansen organism in preparations from tissues is necessary. One cannot rely on his pathologic diagnosis; indeed the most that pathologists usually are willing to report is that a given section shows appearance "compatible with leprosy" which is not very

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helpful. Of course, if characteristic acidfast organisms are found in the section, no question remains. The physician can not be too careful in the appraisal of the results of laboratory diagnostic procedure. It is, I think, becoming generally recognized that the blood serum from many cases of leprosy gives a false positive result in the serologic tests for syphilis; hence this is of relatively little value in distinguishing between leprosy and syphilis. A very considerable number of cases of leprosy have been wrongly labeled syphilis for this reason. The intradermal tuberculin test often is positive in leprosy even without the co-existence of tuberculosis. A skin test made with extracts of leprosy tissue, known as the Deprolin or Lepromin test, is in use, but is of little or of no value in diagnosis; possibly it may be of service in prognosis. Even a test apparently so easy and direct as the identification of the acidfast organism of leprosy is subject to possible errors. The writer has seen serious mistakes made by the erroneous identification of non-pathogenic acidfasts as Hansen's bacilli. It is particularly easy to make errors in specimens taken from the nasal cavities. In any case, to be significant, organisms must be characteristic not only in being acid and alcohol fast but in number and arrangement as well. If necessary, animal inoculation may be resorted to in order to exclude *Mycobacterium tuberculosis*; *Mycobacterium leprae* being harmless for laboratory animals. It is in relation to histopathologic diagnosis that errors are most frequently made. I have seen the same specimen (section) submitted to four well qualified pathologists, all with much experience in the pathology of skin diseases, and four diagnoses were made: sarcoid, syphilis, tuberculosis, and leprosy. No final satisfactory diagnosis ever was reached in the case, but leprosy could be excluded with reasonable certainty on epidemiologic grounds, and the progress of the case suggested sarcoid rather than any other condition. Cases that show only neurological changes clinically may give great difficulty in diagnosis, but these cases are of relatively little im-

portance from the point of view of communicability.

While early diagnosis always has been desirable, perhaps it has become more important in the light of recent discoveries in the field of therapeutics. Early diagnosis, especially of neural types, usually is not of great importance since public health measures as well as medical treatment are not sufficiently useful to make urgent very early diagnosis.

The tuberculoid form of the neural type is atypical clinically, usually yields negative smears, and histologically leaves even the experienced observer often in doubt as to the diagnosis. Fortunately, this form tends to spontaneous recovery and probably is of little importance from the point of view of transmission; hence diagnosis is of relatively less importance even in endemic areas.

The cases giving the most difficulty in diagnosis are usually in children. This may be illustrated by the fact that the writer has had under observation for a period of about eight years a young female, who has been seen by numerous physicians skilled in the recognition of leprosy and in neurology, about whom a definite decision is still to be made. It is in connection with problems of diagnosis that the physician can expect aid from official health agencies. If local and state authorities are not prepared to make, or to confirm a diagnosis, the U. S. Public Health Service always stands ready to provide consultation and to take final responsibility.

TREATMENT

2. The treatment of the disease by the physician is the field of chief interest. He should recognize that there is a strong tendency in many cases of leprosy toward recovery, regardless of therapy. This is especially true when the disease attacks children. It must be recognized that on the therapeutic side of management great changes have taken place though there is still no specific remedy. Chaulmoogra oil and its derivatives, so long used and usually so disappointing in the results of administration are no longer regarded as import-

ant—indeed it is a question whether they are of any value. It is understood that they are no longer used at the National Leprosarium at Carville, Louisiana. The drugs of choice now are members of the sulfone group: promin, diasone, and promizole. Of these the largest experience has been in promin, and even here final appraisal remains to be made.

The most recent appraisal of Faget,¹ who was the pioneer in the use of this drug in the treatment of leprosy cases, and his associates is as follows:

“Two years after starting the experimental treatment with promin, it was possible to report that there was a clinical improvement in patients suffering from leprosy when treated with intravenous promin. Four years after starting the study of promin it was possible to report that promin was the best treatment of leprosy ever used at the National Leprosarium and that the action of promin appeared to be a chemotherapeutic effect on the etiological agent of leprosy, which could not be duplicated merely by controlling all secondary infection, as by penicillin, for example. Now it is possible to report that the use of promin in the treatment of leprosy results in improvement in all major chronic manifestations of the disease and that such clinical improvement is accompanied by improvement in bacteriological and histopathological studies. It remains to be seen which drugs, chemically related to promin, will produce results more quickly and efficiently, and what percentage of the patients treated with promin will ultimately be arrested and paroled from the Leprosarium as no longer menaces to the public health.”

It will suffice for the present to say that this drug seems to be the most promising one in use. Favorable results are very slow in becoming evident. Improvement is noticeable after months of treatment, rather than days or weeks. There are occasionally unpleasant manifestations due to this drug. Blood and urine must be examined frequently and the drug discontinued or the dose reduced on the appearance of indica-

tions of unfavorable effects—anemia or nephritis. Annoying drug rashes also are encountered. The drug is given intravenously, daily, in doses beginning with a gram increasing up to 5 grams, but these doses will probably be modified upward. It is advisable to look forward to treatment lasting several years even in cases that are doing well. Diasone and promizole have the advantage of being given by mouth which of course greatly simplifies treatment, but experience with these is too meager to make definite statements of their value.

ISOLATION

3. Finally the physician may be called on to give advice regarding isolation of his patient. Requirements and practices in this respect differ very greatly in different states. While I have made no recent systematic investigation of this subject, I believe that what follows is well founded. New York State does not require reporting of cases of leprosy and of course does not require isolation. New York City requires reporting by physicians and, if clinical type and environmental conditions justify, isolation must be enforced. However, if home conditions are satisfactory, the patient may be cared for in his own domicile. California and Texas require reporting and isolation only if the case is regarded as a menace to associates. Louisiana requires isolation but the law is enforced in a very enlightened and reasonable manner so as to cause as little hardship as possible and to encourage voluntary admission to isolation. Most other states require isolation, but make no special effort to detect cases. When isolation is required it is usual for cases to be sent to the U. S. Marine Hospital (Federal Leprosarium) at Carville, Louisiana. Admission is granted any case upon application at this hospital.

I am advised that in the opinion of experts in law, a patient suffering from leprosy cannot be required to leave the state of which he is a citizen for any reason related to his physical condition. A state, however, can isolate the patient and take other measures that health authorities consider necessary.

After being admitted to the hospital at Carville, the patient usually is kept there until he is regarded as no longer a menace to others or until his home community is ready to receive him. In fairness to the patient, he should be told that admission to the hospital is much easier than release. In brief, for discharge he must present no clinical activity and show no acid fast bacilli for a period of approximately one year. As a general rule, any case requiring medical care should be advised to go to the Federal Leprosarium unless economic circumstances and home environment make satisfactory home care possible.

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INTERSTITIAL PREGNANCY WITH PERFORATION AND INTRA-ABDOMINAL HEMORRHAGE

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NEW ORLEANS

Pregnancy occurring in the interstitial or intramyometrial portion of the fallopian tube represents the most infrequent location of tubal gestation. Wynne,¹ in a review of 2405 cases of extrauterine pregnancies, found only 40 of the interstitial variety, an incidence of 1.06 per cent. Lavelle² reported but 12 cases out of 410 ectopic pregnancies at Bellevue Hospital, an incidence of 2.09 per cent. There have been slightly over 200 cases reported in the literature to date, the latest notation being 199 cases as estimated by Grusetz and Polayes³ in 1944, covering the period up to July 1943.

PATHOLOGY

Anatomically the interstitial segment of the tube lies within the uterine wall, being approximately 1 cm. long with a uterine ostium of approximately 1 mm in diameter. From the uterine opening it curves upward forming a convex arc to the first portion of the isthmus. Microscopically the lumen is

narrow with few folds in the mucous membrane.

The pathologic physiology depends upon the actual site of implantation within the 1 cm. segment and the direction of growth of the ovum. The ultimate fate and termination of the pregnancy according to Polak⁴ are the following:

1. Death of the ovum
2. Expulsion of the ovum into the uterus with abortion or secondary implantation.
3. Rupture into the peritoneal cavity.
4. Rupture into the broad ligament.

Not included in this classification are full-term interstitial pregnancies of which approximately six have been reported.

With growth of the ovum, placentation permeates the thin mucous membrane and involves the myometrium so that in most cases a miniature placenta accreta is formed. The extent of this ingrowth, of course, is dependent upon the coincidental hypertrophy and hyperplasia of the myometrium.

Grossly the contour of the uterus is gradually altered with a corneal enlargement and gradual thinning of the overlying uterine musculature. Eventually the sac will consist of only peri-uterine connective tissue and serosa, explaining the frequency of rupture and profuse hemorrhage.

Due to the temporary protection of uterine muscle fibers interstitial pregnancies usually survive slightly longer than tubal pregnancies in the outer segments. At best, however, rupture usually takes place during the second and third months. Those pregnancies progressing to six or more months are rare and are only made possible by the development of a thick restraining sac.

In the terminal pathology, although rupture is more frequent, perforation without an actual "blow out" should be mentioned. The case herein reported terminated by perforation, as did a case reported by Stein.⁵

Etiologically, the same factors as stated for the usual tubal pregnancy are applicable to interstitial pregnancy, that is, congenital abnormalities, salpingitis, diverticula, tumors, operative trauma, and peri-

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tubal adhesions. In those cases occurring on the same side where salpingectomy has been performed⁶⁻⁸ the probability of trans-uterine migration of the fertilized ovum must be entertained.

DIAGNOSIS

Diagnosis may best be discussed under the following two headings:

Before rupture or perforation: Diagnosis may be made without too much difficulty if its possibility is kept in mind. Palpation of a cornual mass continuous with the uterus, with a history suggestive of tubal pregnancy, should lead to an accurate diagnosis. Differential diagnosis must include (1) tubal pregnancy in the proximal isthmic segment; (2) pregnancy in congenitally deformed uteri (rudimentary horn, bicornate uterus); and (3) cornual myoma with intrauterine pregnancy. Wynne reports that 23 per cent of the reported cases were unruptured at the time of operation.

After rupture or perforation: Diagnosis after intra-abdominal hemorrhage has occurred is practically impossible, the usual impression being one of ruptured tubal pregnancy. The extreme tenderness on pelvic examination together with abdominal rigidity and distention prevents accurate palpation of the pelvic viscera.

TREATMENT

In general, the type of operation will depend upon (1) the general condition of the patient; (2) associated pelvic pathology; and (3) age and parity. The mortality in Wynne's series was 11.9 per cent, at least four times that of ordinary tubal pregnancy. In those cases operated upon before rupture the survival rate was almost 100 per cent. In the young patient in fairly good condition the conservative procedure of corneal resection should be performed whenever possible. Good results have been obtained and subsequent normal pregnancy may take place.⁹ When haste and surety are essential, or in the multipara, hysterectomy is advisable.

CASE REPORT

Mrs. F. C., age 41 years, Para II, ages 12 and 6 years, two spontaneous early abortions both since the birth of the last child without complications. Normal menstrual history prior to present illness.

No previous abdominal operations. Last menstrual period November 15, 1947.

On February 18, 1948 the patient had a sudden attack of severe abdominal pain, generalized at the onset. There was associated weakness but no loss of consciousness. No history of bleeding since the last menstrual period.

The patient was admitted to Touro Infirmary at 3:45 p. m. and was seen in consultation. Examination revealed a well developed slightly obese white female complaining of generalized abdominal pain and weakness. The skin was pale but warm and dry. Blood pressure was 120/80, pulse 60, temperature 98.6°F.

The abdomen was slightly distended, with moderate rigidity and generalized tenderness. An indefinite mass was palpated in the lower mid-abdomen.

Vaginal examination revealed generalized pelvic tenderness. The uterus could not be outlined, but the cervix was slightly softened. No masses were palpable in the adnexa or cul-de-sac.

Laboratory Data: Hemoglobin 8.8 gms., 56 per cent. Red blood cells 2,750,000. White blood cells 12,900 with differential of 88 per cent neutrophils and 12 per cent lymphocytes.

Preoperative Diagnosis: Ruptured ectopic pregnancy with intraabdominal hemorrhage.



Figure 1. The gross specimen as removed at operation, showing the globular enlargement at the left cornu and a translucent area of protruding amniotic sac.

Operation: At 8 p. m., with the patient in good general condition (blood pressure 140/90, pulse 94), under general anesthesia, a cul-de-sac puncture was performed and free blood aspirated. Laparotomy was done, and on opening the abdomen approximately 800-1000 cc. of free and clotted blood was encountered. The uterus was delivered into the wound and found to be distorted by a globular mass at the left cornu measuring approximately 6 cms. in diameter. The dome of the mass consisted of thinned out muscle fibers

covered by serosa with several translucent blebs of protruding amniotic sac through which the fetus was visible. The proximal half of the mass was covered by muscle fibers which gradually thinned out toward the top.

Posteriorly there was a perforation of the uterus at the junction of the sac and adjacent uterine musculature. Active bleeding was present. There was no hemorrhage into the amniotic cavity. Both tubes and ovaries appeared perfectly normal. A small corpus luteum was noted in the left ovary.

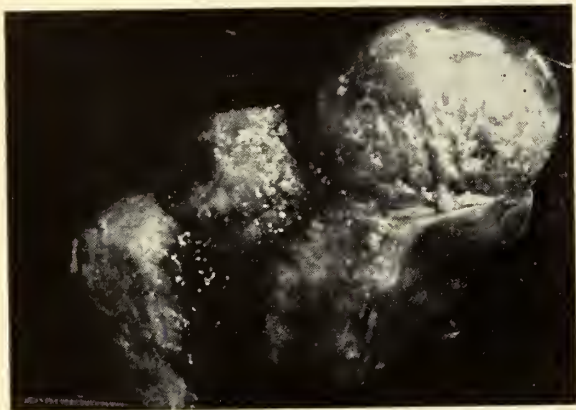


Figure 2. The uterus opened with the intact amniotic sac, its lower half being covered by thinned out placental tissue. Note the thick endometrial decidua.



Figure 3. The amniotic sac opened revealing the fetus and placenta.

A supracervical hysterectomy was performed. The patient received 1000 cc. of whole blood during surgery and left the operating room in good condition.

Pathology Report: Ectopic pregnancy, left fallopian tube, interstitial portion. Decidual endometrium. (Fetus measured 60 mm. crown-rump.)

The postoperative course was smooth. Wound healing was by primary intention, and the patient was discharged on February 26, 1948.

SUMMARY

1. A case of interstitial tubal pregnancy terminating with perforation rather than rupture has been reported.

2. Accurate preoperative diagnosis was impossible because of intra-abdominal hemorrhage.

3. Cul-de-sac puncture was useful as a diagnostic adjunct.

4. The clinical picture of shock was curiously absent despite marked blood loss.

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CARCINOMA OF THE FEMALE URETHRA*

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AND

JOHN BURTON, M. D.†

NEW ORLEANS

Our interest in this disease was stimulated by 2 cases which recently came under our observation. A review of the records of Charity Hospital of Louisiana since the establishment of the Unit Record System in 1942 revealed a total of 8 cases of primary urethral cancer in the female.

Carcinoma of the female urethra is infrequently encountered but is not unusually rare. Up to the present time less than 300 cases have been reported. However, it is reasonable to presume that this figure does not represent the true frequency of the disease. The condition usually develops in the fifth and sixth decades, is more common in

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*Read at the meeting of the Orleans Parish Medical Society, October 11, 1948, in New Orleans.

married women, and rarely occurs before the menopause.

The etiology is not known but many believe that chronic irritation and infection must play some part in the disease. The urethra of the female is constantly exposed to infection and trauma by cohabitation and child bearing. Any definite relationship between a caruncle and carcinoma of the urethra seems improbable. However, in spite of the marked frequency of urethral caruncle, Hess, Ratner and others consider it a definite precancerous lesion and advise complete excision and biopsy in all cases.

From the pathological standpoint three types of neoplasm are encountered: (1) epithelioma, (2) adenocarcinoma, and (3) sarcoma. The growth spreads by extension along the urethra to the bladder, or to the vulva and vagina. Metastasis occurs early to the inguinal lymph nodes.

The symptoms of the disease are not characteristic. The most frequent signs and symptoms are hematuria, painful urination, frequent urination, local mass, and urinary obstruction. The diagnosis is usually made late in the disease, consequently the prognosis is universally poor.

Treatment consists principally of surgical excision and radiation therapy. Recent reports indicate more favorable results with the use of radium implantation. Deep x-ray therapy has also been of value. Surgical excision of the growth and thermocoagulation of the base is possible if the lesion is small and located in the outer one-third of the urethra. Caution of course must be taken with all surgical procedures so as not to injure the sphincter muscle. Radical surgery includes complete removal of the urethra, bladder, and inguinal nodes following transplantation of the ureters into the skin or sigmoid.

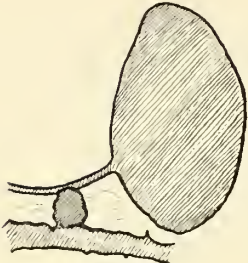
A brief review of the 8 cases herein presented is as follows: Of the 8 cases, 6 were colored females. The average age was 61 years, the youngest being 40 years and the oldest 78 years. All of the cases were diagnosed pathologically as epitheliomas and a wide variation of malignancy was

noted. The symptoms in order of frequency of occurrence are hematuria, painful urination, frequency of urination, retention of urine and urethral discharge. All 8 cases revealed a palpable mass in the anterior vaginal wall or a visible tumor at the urethral meatus. Three of the cases had metastasis to the inguinal nodes. Duration of the symptoms was from one week to six months. One case gave a history of a caruncle which has been treated by thermocoagulation six weeks before admission. Treatment consisted principally of radiation therapy. Four of the cases were treated with radium implantation, 3 with deep x-ray therapy and 1 with radical surgery. In 2 of the cases the x-ray therapy was merely palliative because of the advanced stage of the disease. One case had a ureterosigmoidostomy preliminary to radical excision of the growth, but the patient died of urinary infection and renal failure three weeks following the transplantation. Of the 8 cases, 4 died in a short interval following admission, 1 patient is alive two years following treatment, another patient is alive one year following treatment. Neither of the cases still alive has shown evidence of a recurrence at recent examinations. One case admitted and treated a short time ago cannot be evaluated at present.

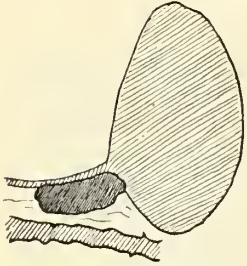
Each case is illustrated diagrammatically in Figures 1, 2, and 3. They demonstrate the approximate location and extent of the lesion. A brief review of the eight cases individually is as follows:

CASE REPORTS

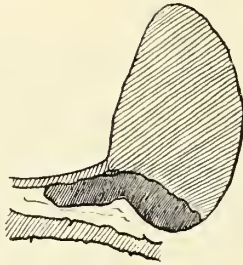
Case No. 1. Colored female, age 64. Patient complained of hematuria and increasing urinary difficulty for two weeks before admission. Examination revealed an indurated mass in the anterior vaginal wall. The neoplasm was viewed through an endoscope and biopsy revealed an epithelioma. Radical excision of the tumor was contemplated and a bilateral transplantation of the ureters in the sigmoid was accomplished. The patient died of pyelonephritis and renal failure, however, before the second stage of the procedure could be done.



CASE 1.



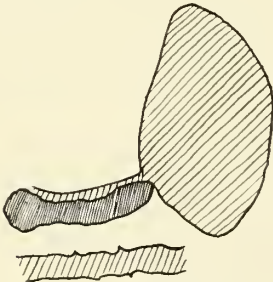
ADMISSION FINDING



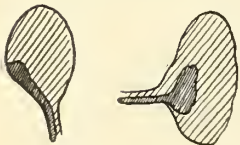
4 MONTHS LATER

CASE 2.

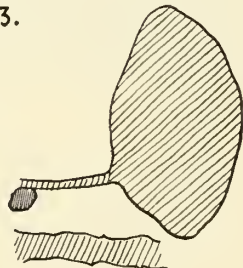
Case No. 2. Colored female, age 52. Patient complained of frequency, pain and straining on urination for a period of two months. Examination revealed an indurated mass the entire length of the urethra. The growth was viewed through the endoscope and biopsy diagnosis of epithelioma was made. Treatment consisted of 1800 mgm. hours of radium. The patient was examined four months later and the growth had extended over the entire floor of the bladder. The patient expired soon after.



CASE 3.



CASE 4.



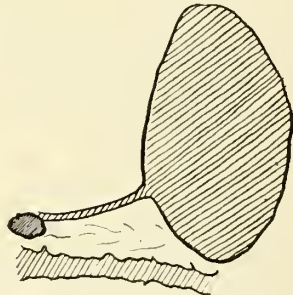
CASE 5.

Case No. 3. Colored female, age 78. The patient's only complaint was intermittent hematuria for about four months. Examination revealed a cauliflower-like mass 2 cm. in diameter protruding

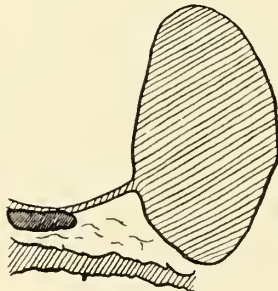
from the urethral orifice and extending to the midurethra. Bilateral inguinal adenopathy was present. Biopsy of the lesion proved it to be an epithelioma. Treatment consisted of 1500 mgm. hours of radium to the urethral lesion and insertion of radium needles into the inguinal areas. The patient died three weeks later.

Case No. 4. Colored female, age 70. Complaints were pain on urination and a mass in the right inguinal region of three weeks duration. Examination revealed a hard mass in the anterior vaginal wall. The urethral mucosa was eroded and biopsy revealed an epithelioma. Metastasis to the inguinal nodes was present. Treatment consisted of palliative x-ray therapy. The patient was seen six months later at which time she was incontinent and had extensive infiltration of the urethra and bladder. She expired soon after.

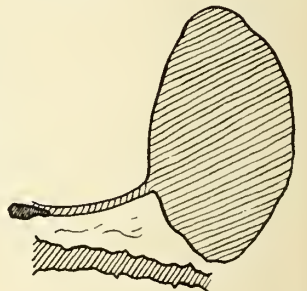
Case No. 5. Colored female, age 75. Complaints were pain on urination for six months and terminal hematuria for the past three months. Examination revealed a friable mass at the external meatus. Biopsy revealed a low grade epithelioma. There was no evidence of metastasis. Treatment consisted of deep x-ray therapy. The patient returned in six months and again two years after treatment and at each examination no evidence of recurrence or metastasis was found.



CASE 6.



CASE 7.



CASE 8.

Case No. 6. Colored female, age 42. Patient complained of bleeding and discharge from the urethra of one month's duration. Examination revealed a necrotic friable mass protruding from the external meatus. Biopsy report was that of an epithelioma. Palliative x-ray therapy was given. Six weeks later the patient was admitted

to the hospital following a urethral hemorrhage and she died shortly thereafter.

Case No. 7. White female, age 62. The patient's only complaint was bleeding from the urethra for one week before admission. Examination revealed a mass 3 cm. in diameter in the anterior vaginal wall. A necrotic, hemorrhagic mass protruded into the urethra and the biopsy report was that of an epithelioma. Treatment consisted of 2340 mgm. hours of radium. The patient has been followed for one year and there is no evidence of recurrence.

Case No. 8. White female, age 40. The patient complained of local pain, irritation, and frequency of urination. Examination revealed a red, tender mass at the external meatus. It was believed to be a caruncle and was destroyed by fulguration. Six weeks later the patient returned because of no relief from her symptoms. A biopsy was taken and a report of epithelioma returned. Treatment consisted of radium implantation, a total of 2000 mgm. hours. This case has only recently been treated and no conclusions can be made.

SUMMARY

Carcinoma of the female urethra, although not frequently encountered, presents a serious problem, principally because of the poor end results. Since there are no characteristic signs or symptoms, the diagnosis is usually made late in the disease. Early diagnosis can be made possible only by biopsy of all growths at the urethral orifice, regardless of their benign appearance. Reported in this paper are eight cases of carcinoma of the female urethra which have been admitted and treated at Charity Hospital of Louisiana since 1942. This series, though small, is fairly representative of the general experience with this disease.

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SURGERY OF THE AGED*

SIDNEY M. COPLAND, M. D.†

NEW ORLEANS

Since the advent of the twentieth century, the span of life has been increased 17.5 years, for whereas the expectation of life in 1900 was 49.5 years, it is now 67 years. Again, once an individual reaches age 65 his life expectancy is 11.01 years, or age 76.01 years.

EXPECTATION OF LIFE

Year	Combined Sexes	Male	Female
1900	49.5 yrs.	48.2 yrs.	51.1 yrs.
1910	52.0 yrs.	50.2 yrs.	53.6 yrs.
1920	57.5 yrs.	56.3 yrs.	58.5 yrs.
1930	61.0 yrs.	59.1 yrs.	62.7 yrs.
1940	65.0 yrs.	62.8 yrs.	67.3 yrs.
1945	67.0 yrs.	64.4 yrs.	69.5 yrs.

The life span of the male has been increased 16.2 years since 1900 and the female life span has been increased 18.4 years.

LIFE EXPECTANCY AFTER AGE 65

At 65 yrs.—Life Expectancy is 11.01 yrs. or 76.01 yrs.
 At 70 yrs.—Life Expectancy is 8.99 yrs. or 78.99 yrs.
 At 75 yrs.—Life Expectancy is 6.82 yrs. or 81.82 yrs.
 At 80 yrs.—Life Expectancy is 5.06 yrs. or 85.06 yrs.
 At 85 yrs.—Life Expectancy is 3.66 yrs. or 88.66 yrs.

From the aforementioned statistics one can deduct that a large number of these survivors owe their continued longevity to increased surgical knowledge. The most pertinent factors in the knowledge are the principles that make the aged patient safe for surgery.

DEHYDRATION AND MALNUTRITION

Surgical shock is rarer today than at any time in the last two decades despite more extensive surgery. This is due to the patient coming to the operating table better prepared. Dehydration and malnutrition have been corrected preoperatively and the loss of unknown amounts of fluid and blood during operation is corrected by transfusions and infusions during operation. The aged should not come to surgery having anemia for this makes a poorer anesthetic risk. However, one should exercise cer-

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tain caution in administering fluids to the aged. The amount and rate of administration of fluids should be such as not to crowd the right heart. Auscultation of the pulmonary bases and venous pressure readings serve as an excellent index of right heart failure. A patient on a parenteral existence should have at least 8 grams of sodium chloride per day and a total of 3,000 cc. of fluids, the remaining fluid being glucose solution. However, if the patient is intubated or has an intestinal fistula, all additional fluid losses should be compensated for by additional infusions. The blood chloride and carbon dioxide combining powers serve as a guide in acidbase equilibrium or to determine whether an alkalosis or acidosis is occurring.

VITAMIN REQUIREMENTS

The vitamin requirements of the aged do not differ from that of the remaining adult group except that more aged people have a tendency to be deficient. Fluid balance and vitamins are especially related to the serum protein and together serve as a good index as to the nutritional status of the patient. The blood ascorbic acid and serum protein values are of special concern in wound healing and the prophylaxis of leakage at anastomotic suture lines. These values may also affect the incidence of evisceration. When patients are on a parenteral life, a minimum of 500 mg. of vitamin C and 100 mg. vitamin B are given daily by infusion. When they return to oral feedings, elderly patients are routinely placed on vitamins by mouth. Vitamin K is of special interest, for the jaundiced patient frequently is in the older group. Synthetic vitamin K by needle is the method of choice, and a prothrombin level 80 per cent of normal is safe. In many aged individuals, who possess marked liver damage, there may not be a satisfactory response to vitamin K and transfusions of whole blood are of value in such cases.

ANESTHESIA

It is impossible to discuss surgery in any age group without a critical consideration of anesthetic agents.

The preanesthetic medication should permit the patient to sleep well the night be-

fore operation and abolish fear and apprehension without causing respiratory or circulatory depression. The best drug for this purpose is either 2 grains of phenobarbital subcutaneously or 1½ grains of secenal the night before operation. No barbiturate should be given the morning of operation. The preoperative hypodermic is given one hour before operation and caution should be exercised when employing morphine in the aged. The feeble patient and the cardiac are very susceptible to the respiratory depression due to morphine and the dosage is virtually that used in children. Morphine gr. 1/8 to gr. 1/10 is the usual dose in patients over 60 years and may be omitted in doubtful cases. Atropine is usually the other drug used in combination with morphine and 1/300 grain is an adequate dose. This drug is never used in combination with scopolamine.

I have favored the use of an ethylene-ether mixture as the choice inhalation anesthetic in the very old and in the cardiac. This combination has served well in a large variety of cases. One word of warning about any inhalation anesthetic in the aged is to note whether or not the patient is anemic. In such a condition the blood is naturally carrying less hemoglobin and this results in a diminished load of oxygen thereby resulting in anoxia. Every effort should be made to correct anemia previous to operation.

Cyclopropane is not recommended in the aged despite the fact that it permits a high degree of oxygenation.

Spinal anesthesia is used in many cases especially when the level of anesthesia is below the second lumbar vertebra. However, it is not used on any patient with arteriosclerosis. The ill effects of spinal anesthesia, other than involvement of the respiratory center, are due to the production of a vasodilatation. This causes a stagnant anoxia and when it occurs, the best means of combatting it is by means of vasoconstrictor drugs, such as neo-synephrine or ephedrine. However, the rigid vessels of the arteriosclerotic do not respond to these vasoconstricting drugs and a critical situation results.

Anoxia is the condition the anesthetist dreads in any elderly patient for the aged do not tolerate anoxia as do the young and middle aged. The latter possess a certain elasticity and respond readily to counter-measures but the aged do not possess such a comeback and a fatality may result. For this reason the anesthetist must be more than ever on the alert when administering an anesthetic to the old patient.

Sodium pentothal is not recommended in the aged and for good reason. This drug is eliminated very slowly from the old patient, especially through the liver and kidneys, and a patient may not react from such an anesthetic for many hours. Such a prolonged state of unconsciousness is most undesirable and favors pulmonary complications.

CHEMOTHERAPY

Chemotherapy is of inestimable value in the elderly surgical patient because of the large volume of gastrointestinal cases in this group. The dosage of penicillin is the same as in any other group. Streptomycin is used in divided dosage of $\frac{1}{4}$ gram every six hours, and is rarely continued over seven days. During this period of administration the patient is watched for eighth nerve or renal complications. Sulfasuxidine or sulfathalidine is employed as a preliminary preparation to intestinal surgery. These sulfa drugs are relatively free of toxic manifestations. Sulfadiazine and sulfanilamide are rarely used and should be employed only with caution. The elderly patient usually has impairment of renal function and these drugs are more dangerous in the aged. Sulfanilamide is never employed in the peritoneal cavity of the elderly patient. If sulfadiazine is employed, one should have frequent urinalyses and sulfa blood levels.

EARLY AMBULATION

Early ambulation appears to be of more distinct benefit in the aged than in any other group. By early ambulation is meant that the patient is walking within twenty-four hours. Pulmonary complications such as pneumonia and embolism appear to have a much lower incidence in the early ambu-

lated old patient. The convalescence is shorter and more smooth.

THROMBOSIS AND EMBOLISM

We do not subscribe to the practice of routine superficial femoral vein ligation in aged patients as a prophylaxis against thrombosis and embolism. However, the aged patient should be examined daily for evidence of thrombosis, and upon even a suspicion of thrombosis, a superficial femoral vein ligation below the profunda should be done. However, some surgeons prefer dicoumarol and heparin therapy rather than surgery.

The aged patient, with the history of a previous coronary attack, presenting a surgical emergency has appeared to be a difficult problem to some. Our experience is to treat these patients with the surgery indicated and ignore the previous cardiac history. It is remarkable to note the lack of cardiac complications in the majority of such patients when they are submitted to major surgery. Recently, one patient in our series had a hemoconcentration during a peritonitis following a ruptured appendix. He was given 7,000 cc. of fluids intravenously in twenty-four hours. This patient had suffered an acute coronary thrombosis sixteen months previously. He recovered.

TYPES OF SURGERY

The frontiers of surgery have been advanced markedly in the last ten years and more aged individuals are becoming eligible for surgical procedures. This is especially true in the field of gastrointestinal surgery. Gastrectomy, either subtotal or total, is now performed in every first flight hospital. Resection of the esophagus with esophagogastrostomy is rescuing a large group formerly destined to die of malignancy. Colon resections of varying extent are accomplished with amazingly smooth convalescence in many aged individuals. It is startling to see these old people walking twenty-four hours after the above extensive procedures. The surgical treatment of cirrhosis and ascites is indicated in a large group. There are several procedures one may perform such as portal-caval anastomosis, splenorenal shunt, or

the insertion of an intramural button in the abdominal wall in cases of cirrhosis or ascites. The last procedure, a button in the abdominal wall, in cases with rapidly recurring ascites carries very little morbidity and virtually no mortality. Many patients can be made free of intraabdominal fluid accumulations by such a simple procedure and cases of cirrhosis have been made symptom free. Many old patients have been subjected to resection of the pancreas with varying results. However, this procedure is one of great magnitude and takes four and a half to six hours in expert hands.

If an elderly patient can tolerate such extensive surgery, one can conclude that the patient is being made safe for surgery.

I purposely do not go into thoracic surgery, for the preponderant majority of patients in this group are of a younger age.

Fractures of the hip are most common and whether they be of the neck proper or intertrochanteric, the outlook is usually good. There yet remains a group of about 15 per cent which will develop absorption of the head and incur a poor result. At present, these patients with fractured hips are in traction for forty-eight to seventy-two hours previous to operation. This time usually suffices to overcome muscle spasm and any displacement present. If reduction has not occurred, the part is manipulated at operation. An internal fixation of the hip is done with either the Martin or Smith-Peterson technic. If an intertrochanteric fracture is present, a Thornton plate is used. These patients are returned to their beds with a simple dressing over the incision but no type of plaster fixation. Movement of the affected leg is encouraged and they are placed in a wheel chair three to four days following operation. At the end of three weeks they are fitted with a long nonweight bearing caliper and crutches and ambulation is begun. All support is discarded at the end of five to six months following injury. The above routine is employed in patients in the seventies and eighties as described.

CASE REPORTS

Mrs. M. H., age 98 years, was admitted to Touro

Infirmary on November 26, 1948, with a diagnosis of an acute abdomen. The diagnosis was acute appendicitis. She was operated upon that evening under ethylene-ether anesthesia through a low right rectus incision. The appendix was patent but not acute. The only positive finding was small hard mesenteric nodes. No organs were removed. She was up and walking within twenty-four hours and was discharged in nine days.

Comment: Despite this patient's age, it was deemed necessary to operate. Clinically, the diagnosis merited exploration, and though the diagnosis was wrong no regret is in order for this patient was given a chance for recovery. Incidentally, her mother lived to be one hundred years of age.

Mr. J. R. was operated upon in 1947 for a strangulated femoral hernia at the age of 70 years. He was up and walking on the day following operation. He was discharged in ten days and returned December 9, 1948, with a fracture of the neck of the right femur. He was then 72 years old. After being in traction forty-eight hours, an internal fixation of the right hip was done. He sat up in a chair in forty-eight hours and was discharged in ten days. Three weeks following operation he was walking with the aid of crutches on a non-weight bearing long caliper.

Comment: This patient, despite two serious surgical illnesses after the age of 70 years, is self-sufficient and enjoys relatively good health.

Mr. M. R., age 64, was admitted to Touro Infirmary on October 26, 1948 with a diagnosis of an acute ruptured appendicitis. He had an acute myocardial infarct sixteen months ago. He was immediately operated upon and the appendix removed. A generalized peritonitis followed despite chemotherapy. He had marked dehydration as a result of a paralytic ileus. He was intubated for two weeks and in one twenty-four hour period received 7,000 cc. of intravenous fluids when a marked hemoconcentration was evident. The following day he received 5,000 cc. of fluid. He was discharged on November 20, 1948 and is well.

Comment: This case illustrates the amount of strain that a patient who has had former coronary thrombosis can tolerate under a surgical emergency.

CONCLUSION

The attitude of masterful inactivity in the aged patient with a surgical disease is not justified. The old aphorism, "Let the patient do his own dying," is outmoded in most instances. If the surgeon uses the facilities now available in making the patient safe for surgery, many of these elderly people will live to be even older and more comfortable. Such an objective is worthy

of the effort. More people live to reach old age and old age surgery than ever before since the span of life in the last fifty years has been increased 17.5 years.

PRESENT STATUS OF CHLOROMYCETIN THERAPY

E. H. PAYNE, M. D.

DETROIT, MICHIGAN

Burkholder¹ discovered that cultures of a *Streptomyces* sp., isolated from a Venezuelan soil sample, inhibited the growth of certain pathogenic bacteria. Ehrlich,¹ Bartz,² and Smith,³ and their associates, enlarged and extended this study to include an impressive list of organisms. (Tables I and II).

chloromycetin was relatively nontoxic to animals either by oral or parenteral administration.

TYPHUS AND TYPHOID FEVER

By official invitation, clinical study of chloromycetin was initiated in Bolivia by Payne and Knaudt. They reported their preliminary results before the La Paz Medical Society on December 16, 1947.⁵ Treatment was given by both oral and intravenous routes. Final reports of this study were made^{6, 7} after an adequate follow-up of several months. (See Table III).

This Peruvian-Bolivian typhus epidemic proved to be highly virulent, resulting in a death rate approaching 30 per cent of the untreated cases. The 24 cases treated with chloromycetin all recovered rapidly,

TABLE NO. I
CONCENTRATIONS REQUIRED FOR COMPARABLE EFFECT

ORGANISM	PENICILLIN I.U./ml	CHLOROMYCETIN ug/ml	RATIO P/C
<i>Escherichia coli</i>	14	0.33	25
<i>Klebsiella pneumoniae</i>	4	0.33	7
<i>Salmonella Schottmülleri</i>	4	0.33	7
<i>Shigella paradyserteriae</i> (Sonne)	12	0.20	36
<i>Staphylococcus aureus</i>	0.03	1.00	0.018

TABLE NO. II
CONCENTRATIONS REQUIRED FOR COMPARABLE EFFECT

ORGANISM	(IN DIFCO PENASSAY BROTH)		RATIO S/C
	MYCIN BASE ug/ml	CHLORO- MYCETIN ug/ml	
<i>Bacillus mycoides</i>	0.66	0.63	1.05
<i>Eberthella typhosa</i>	1.66	0.36	4.61
<i>Escherichia coli</i>	2.50	0.50	5.00
<i>Klebsiella pneumoniae</i>	0.55	0.25	2.20
<i>Proteus vulgaris</i>	8.00	0.50	16.0
<i>Salmonella schottmülleri</i>	1.66	0.50	3.32
<i>Shigella paradyserteriae</i>	1.00	0.33	3.00
<i>Staphylococcus aureus</i>	1.66	1.00	1.66

Chloromycetin was crystallized,² and doubtless will be successfully synthesized. McLean^{1, 3} discovered its activity against *Rickettsia prowazeki*, and the results were so outstanding that a supply of the material was sent to the Department of Virus and Rickettsial Diseases, of the Army Graduate Medical School where Smadel⁴ and associates confirmed his results. Gruhzt³ found

although several were considered to be beyond hope. Early cases of typhus recovered in twenty-four hours and all cases became convalescent by the third day.

During this study 2 prominent individuals in a grave condition with typhoid fever were treated. Their recovery was surprisingly prompt but the investigators considered it inadvisable to report results at that time, although the susceptibility of *E. typhosa* to chloromycetin had been demonstrated in vitro previously by Joslyn.⁸

Early in 1948, Smadel⁹ and his associates, working in Mexico, treated 5 typhus fever patients with chloromycetin; their results confirmed the Bolivian studies. Smadel and Woodward¹⁰ later led a group to Malaya for the study of scrub typhus and its treatment with chloromycetin. Their results deserve the wide attention that they have received. (See Table IV). During their work with scrub typhus, Woodward¹¹ independently made the accidental discovery that chloromycetin was effective in treatment of typhoid fever.

Read at meeting of the Orleans Parish Medical Society, December 13, 1948, in New Orleans.

TABLE NO. III

CASE	AGE AND SEX	WEIL-FELIX	TEMP. °C.	PULSE	DOSE (GRAM)			RETURN Temp. (Hours)	To Normal Pulse (Hours)	SYMPTOMS RELIEVED (Hours)
					Oral	Daily I. V.	Total			
1	15 F.	1:1200	40.9	140	1.0	----	2.5	48	54	60
2	16 F.	1:1200	39.7	130	1.0	----	2.5	48	48	60
3	12 F.	1:1400	40.0	140	----	0.4	1.2	54	48	72
4	14 M.	1:1200	41.0	140	----	0.5	1.25	48	36	54
5	32 F.	1:1200	39.0	120	2.0	----	4.0	48	48	48
6	18 M.	1:1400	39.5	130	1.5	----	3.0	42	46	36
7	17 M.	1:1200	40.0	140	----	0.8	2.8	24	24	42
8	38 F.	1:1200	40.2	140	1.0	0.8	4.2	32	36	48
9	18 M.	1:400	38.9	120	2.0	----	3.5	24	30	48
10	45 M.	1:600	Subnormal	130	1.0	1.0	5.8	48	30	72
11	48 F.	1:1200		140	1.5	1.0	4.0	38	38	52
12	38 F.	1:600	39.7	120	2.0	0.8	3.9	24	30	60
13	30 M.	1:1200	39.4	120	3.0	----	3.8	24	24	48
14	25 M.	1:1200	40.3	140	3.5	----	3.9	24	24	48
15	29 F.	1:1200	40.1	140	1.5	1.2	4.0	24	24	48
16	52 M.	1:1200	39.6	120	2.0	0.6	4.0	24	24	48
17	22 M.	1:1200	39.7	140	1.5	----	3.0	24	24	36
18	48 M.	1:1200	40.2	140	1.5	----	3.6	36	42	54
19	17 F.	1:600	39.7	120	1.5	----	3.0	26	30	42
20	43 M.	1:1200	39.5	120	1.5	----	3.0	24	24	48
21	54 M.	1:600	39.7	140	1.5	----	3.0	28	36	48
22	42 F.	1:400	40.6	140	3.0	0.3	8.8	44	48	72

TABLE NO. IV
SCRUB TYPHUS PATIENTS

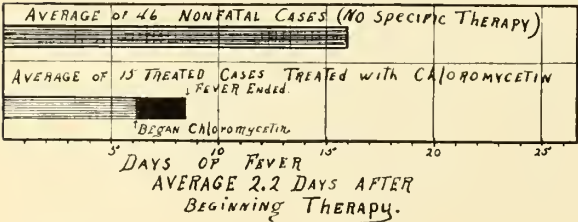
No. of Patients	TREATED		UNTREATED	
	25	18 Males 7 Females	12 All Males	
	Variation (Days)	Average (Days)	Variation (Days)	Average (Days)
Day after onset Rx begun	3 to 11	6.2		
Last febrile day of illness	4 to 12	7.5	13 to 29	18.1
Duration of fever (Hrs.) after Rx begun	10 to 96	31.0		
Day after onset discharged from hospital	9 to 28	19.2	17 to 53	30.7
Complications	0	0	1 Parotitis	
Deaths	0	0	1 Pneumonia	
Month of onset	Mar. Apr.	Mar. Apr.	1 17th day Feb. Mar.	Feb. Mar.

ROCKY MOUNTAIN SPOTTED FEVER

Pincoffs¹² and associates have been successful in treating 15 cases of Eastern Rocky Mountain spotted fever with chloromycetin. (See Table V).

TABLE NO. V

Rocky Mountain Spotted Fever



TRACHOMA

The preliminary trial of chloromycetin in treatment of trachoma was carried out, with approval of the Bureau of Indian Affairs, on the Navajo Reservation. All patients were hospitalized at Fort Defiance, Arizona.

Diagnosis of trachoma is not easy, especially in the early stages.¹³⁻¹⁵ Howard¹⁶ considers the biomicroscope of more value than the microscope in making a diagnosis, particularly in the early stages.

The experimental work of Thygeson and Proctor¹⁷ supports the conclusions of Nicolle, Cuenod and Blaizot¹⁸ that trachoma is

due to an infection by a filtrable virus. They¹⁹ concluded that the viruses of trachoma, inclusion blenorrhea, and psittacosis, appear to be a transitional group between Rickettsiae and the typical viruses. Thygeson, Proctor, and Richards²⁰ again confirmed the virus nature of the etiologic agent of trachoma, and offer evidence to support the view that trachoma virus and trachoma elementary body (*Halberstaedter-Prowazek*) are identical.

There are only a few foci of trachoma in the United States, but some remain among the various groups of Indians in the West and Southwest. Energetic treatment over the past eight years by the Indian Service has greatly reduced the incidence. Loe²¹ and associates introduced sulfanilamide as a successful treatment for trachoma at the Rosebud Indian Hospital. These results have been amply confirmed by Hirshfelder;²² Richards, Forster and Thygeson;^{23, 24} Hundley and Cosgrove;²⁵ and many others. The chief objections to this treatment are the length of time required, and the supervision necessary to insure completion of treatment.

Payne, Kassel, Pijoan, and Spence decided that therapeutic trial of chloromycetin in treatment of trachoma was justified. For this trial 16 patients were selected and divided into 2 equivalent groups consisting of 8 controls and 8 who would receive chloromycetin. Each patient

was examined by a slit lamp and found to have the required pannus described by Foster and McGibony²⁶ as well as trachoma follicles. Two of each group were advanced cases, code (type) II. The other 6 in each group had early trachoma, code (type) I. The controls were given routine sulfanilamide treatment. Chloromycetin was administered perorally and the dose varied somewhat with respect to the weight and age of each patient (Table VI). Chloromycetin serum levels were determined in 6 patients to ascertain adequate absorption of the drug.

Both groups of patients exhibited improvement. The blepharitis cleared up during the first two days of chloromycetin therapy. Inflammation of the conjunctiva subsided about equally in both groups although apparently with greater rapidity in the chloromycetin group than among the controls.

During the first two weeks following treatment there was little pronounced change in the trachoma follicles in either group. In only 3 patients receiving chloromycetin was it possible to demonstrate any great improvement in the trachoma follicles. Unfortunately and contrary to our plan the experiment was abruptly terminated during the third week of observation. Due to the limited amount of chloromycetin available it was not possible to extend this study. The fact that the greatest improve-

TABLE NO. VI
TRACHOMA PATIENTS TREATED WITH CHLOROMYCETIN

NAME	AGE	WEIGHT IN KILOS	TYPE OF TRACHOMA	TOTAL DOSE	DAYS TREATED	SERUM LEVEL 3rd Day γ/ml.	BLEPHARITIS 3rd Day	PHOTOPHOBIA 3rd Day	CONJUNCTIVITIS 10th Day	T. FOLLICLES 10th Day
N. G.	6	18.6	I	9. Gm.	4	7	Healed	Neg.	Healed	Reduced
B. M.	6	19.5	I	9. Gm.	4	26	Healed	Neg.	Healed	Reduced
F. J.	12	33.6	I	27. Gm.	6	14	Healed	Neg.	Healed	Reduced
A. T.	11	33.	I	9. Gm.	4	49	Healed	Imp.	Imp.	No change
J. N.	11	31.	I	9. Gm.	4	16	Healed	Imp.	Imp.	No change
E. B.	11	29.3	I	9. Gm.	4	15	Healed	Imp.	Imp.	No change
Bess E.	10	28.	II	13.5 Gm.	3	....	Healed	Imp.	Little change	No change
Bett E.	12	39.	II	13.5 Gm.	3	....	Healed	Imp.	Little change	No change

ment was observed in the 3 cases receiving the largest amount of chloromycetin in relation to their weight is intriguing and enough improvement was observed to stimulate further interest in this work. (See Table VI).

DISCUSSION

The biological action of chloromycetin on the different micro-organisms is as yet not well understood. It appears that both the amount and length of treatment will vary with the different diseases in which it is used.

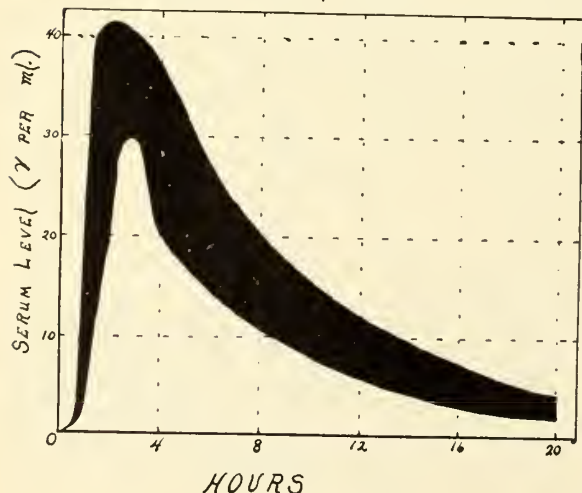
From the meager experience so far gained one may judge that an initial large dose is of advantage. This seems to be indicated both from its activity against the disease and the possibility of the body rapidly adapting itself to the degradation of the drug. For treatment of epidemic and scrub typhus it would appear that a total dose of 5 or 6 Gm. is necessary and that this amount should be given in the first twelve to eighteen hours.

The response of typhoid fever to chloromycetin is not so abrupt and the indications are that treatment should be continued for three to five days, or longer, with a total dosage of 12 to 18 Gm. Approximately the same schedule is indicated in treatment of Rocky Mountain spotted fever.

The rapid absorption of chloromycetin (Table VII) following oral dosage indicates

TABLE NO. VII

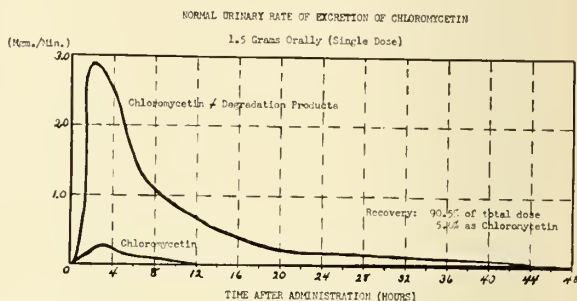
COMPOSITE CURVE Single Dose Chloromycetin 2.5 Gm. Oral Dose



that the only need for a parenteral preparation will be for those patients unable to swallow. These blood levels further indicate that the oral dose need not be repeated oftener than once every eight hours.

Chloromycetin is rapidly destroyed in the body and appears in the urine largely as degradation products. (See Table VIII).

TABLE NO. VIII



Up to the present time no toxic symptoms that could be ascribed to the drug have been observed in any patient taking chloromycetin, nor has there been any indication of toxicity in the blood and urine examinations included in the different studies.

The beneficial effect of intravenous chloromycetin in treatment of epidemic typhus is so rapid that one can be led to suspect that it has an antitoxic activity in addition to a specific action against the organism.

CONCLUSION

Chloromycetin is a compound which exerts a specific therapeutic action against the organisms causing epidemic and scrub typhus, Rocky Mountain spotted fever, and typhoid fever. The extent of its action against trachoma needs further study. Further clinical research awaits adequate production of the compound.

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ALLERGIC EPILEPSY

W. AMBROSE MCGEE, M. D.

RICHMOND, VIRGINIA

The outlook for the child with epilepsy is far brighter today than it was several decades ago. Formerly such a child usually led a cloistered life or at least an abnormal one, and his family frequently had to

take care of him financially throughout his life.

With the introduction of phenobarbital, epileptics had hopes for a more normal future. Then the ketogenic diet proved a great asset to many, but its chief drawback was the lack of palatability of such a high fat diet and the difficulty in preparing it and keeping a child on it. More recently tridione has been used for petit mal, dilantin and mesantion for grand mal, and all of these for psychomotor seizures and Jacksonian convulsions.

While most of the therapeutic research has been along biochemical and pharmaceutical lines, the most recent trend has been different. It deals with the electrical conductivity of the brain, its pulsation and electrical disturbances. The machine used for this determination is the electroencephalograph. It is to the electrical conductivity of the brain what the electrocardiograph is to the heart. By forced ventilation the length of the brain waves is accentuated.

The parents of epileptics¹ show characteristic dysrhythmia in over 90 per cent of instances; whereas, only about 6 per cent of abnormal brain waves are seen in non-epileptics. Persons with cerebral dysrhythmia outnumber actual epileptics twenty to one. Children with personality disorders often have abnormal brain waves.

There seem to be some similarities between epilepsy and allergy. Both have a high incidence of definite hereditary factors. Both begin more frequently in the earlier years of life, and both seem to be influenced by a tendency to store too much reserve alkali during the course of normal metabolism.² Allergic skin tests done in nonepileptics and epileptics showed a much greater percentage of positive reactions in epileptics than in nonepileptics.² This is comparable to a greater number of positive skin tests found among allergic individuals.

Attacks of both disorders start abruptly. One attack tends to predispose to another, and the attacks are rarely fatal although at times alarming. Intercurrent diseases

¹ Read by invitation before the Louisiana State Pediatric Society, April 12-14, 1948.

temporarily seem to benefit allergic conditions, and in epilepsy they may either lengthen the intervals or relieve the patient entirely of convulsive seizures.

Occasionally upon inquiring into a child's past and present history we will find a simultaneous onset of epilepsy and some form of allergy. A few such cases came into my care before the value of the electroencephalograph was generally recognized.

CASE REPORTS

Case No. 1. M. E. W., a white female, was first seen at age 11 months. At that time she weighed only 14½ pounds because of a continuous anorexia, anemia and diarrhea, which was checked by protein and lactic acid milk. From age 1 year to 2 years she had repeated head colds and otitis media with discharge. At 33 months she had an unexplained convulsion. At 4 years she began having epileptiform convulsions lasting 1 to 5 minutes followed by sleep for a short while. At this age she began rubbing her nose often, sniffing frequently, clearing her throat a great deal and eructating often.

On a ketogenic diet and phenobarbital, convulsions were decreased in number and severity. A neurosurgeon suggested an air injection, which was not done. The mother wanted an allergic study, in spite of lack of encouragement. Skin tests showed many positive reactions to such common foods as milk, orange juice, corn, green vegetables, and many fruits, all of which correlated with the severe diarrhea during the first year of life. There was a history of allergy in this child's family.

The child was doing nicely, so far as the number and severity of convulsions were concerned, and her respiratory allergy was improved when the mother advised us, a few months later, that the child had died from an accident.

Case No. 2. W. E. P., a white male of 18 months, was first seen because of frequent epileptic convulsions. The referring psychiatrist was unable to get any satisfactory response. Possible etiological factors were a face presentation and injured arm at birth, a fall from the bed at three months, and convulsions noted at 9 months of age after roseola infantum. The infant had a cold with each tooth, rubbed his nose often and vomited milk frequently. There was a unilateral allergic history on the maternal side. Mentally the child seemed very deficient. The sedatives usually employed for epilepsy were of no value. The electroencephalogram showed typical petit mal dysrhythmia.

Since the child was from such an allergic mother and had symptoms suggestive of allergy, she was given an indirect allergic study which revealed many positive tests. No encouragement from a prognostic standpoint was given the mother. The

child has not improved, and in March 1948 had apparently lost all control of himself.

Case No. 3. B. F. S., age 12 years, had a convulsion following 40 intravenous injections of iron and two subcutaneous injections of a cold vaccine. Convulsions had occurred every few weeks until 12 years of age; phenobarbital was used. X-ray of the skull was negative. Mebaral was also used, but it was later changed to dilantin sodium. Electroencephalogram showed typical petit mal dysrhythmia.

In view of a great deal of allergy of the respiratory and gastrointestinal type and a family history of same, an allergic study was done. On a diet based on past history and positive skin tests, no improvement was noted in the epilepsy but the respiratory allergy improved. The family cooperated nicely. This individual has now grown up and is married. She may go for months without a spell, but then she may have two or three epileptic seizures in a day.

Case No. 4. J. H. A., white male, was first seen at 11 years because of grand mal. His attacks began at 18 months, when he had only two or three attacks. No more seizures occurred until 6 years of age, when they recurred every 6 months. At 9 years they appeared monthly. The attacks lasted from a few minutes to two to three hours. He was put on a strict ketogenic diet for two years. No appreciable improvement was noted.

In addition to the history of convulsions he had a nasal allergy (frequent sneezing, itching, nasal blockage and discharge) and colitis. In infancy he had had severe colic.

After a direct allergic study he was put on a diet avoiding those foods which had given positive skin tests and an antigen was given for epidermal sensitivity. He gradually showed less and less allergy, his convulsions decreased in frequency, and at the last report he was doing nicely.

Case No. 5. J. W. I., white female, age 8 years, was referred on account of epileptic-like spells which lasted a few seconds. The seizures began at 2 years of age, and occurred about every two or three months. At times she was found unconscious.

Her family physician felt she might be allergic due to repeated night sweats, nasal blockage and itching, nasal catarrh, generalized itching without a rash, anorexia and explosive stools. In infancy she had had severe colic and eczema.

A diet based on removal of foods giving positive skin tests and positive history, although strenuous and difficult, proved very valuable. The child completely ceased having epileptic seizures; her allergy subsided and has not recurred.

Case No. 6. L. V. P., white male, age 8 years, was referred for "nervousness." His "nervousness" consisted of typical epileptic-like seizures persisting for only a few seconds followed by a sense of relaxation. Just before an attack he would lean against a wall, become tense, stare into

the distance and have rhythmic jerkings of the upper extremities. Simultaneous with the onset of the epileptiform attacks the boy developed hay fever. There was an additional strengthening link of bilateral allergy. The boy's allergic history went back to eczema in early infancy. After the onset of his hay fever it occurred each fall thereafter.

There was a severe personality problem. The boy did not like school, interfered with other children and did not mind easily. There was a terrific dislike to eggs and milk.

After an allergic study he was placed on a diet free of foods showing a positive history and positive skin tests. In addition he was given an antigen of epidermal and fall pollens.

Within a few months he changed from a nervous, unhappy child to a happy, interested one, surpassed all his classmates, was no longer a problem at home or at school, and his epileptiform attacks ceased. In two years the seizures recurred while he was visiting his maternal aunt in a distant city. It was then found that they were due to a goose feather mattress. All goose mattresses were removed, and seizures ceased. There has been no further hay fever or epileptiform convulsions.

These 6 cases show a possible relation between allergy and epilepsy. Unfortunately, all but 2 were treated before the electroencephalograph became popular and practical. Recently Dees and Lowenbach³ showed the electroencephalogram to be abnormal in high percentage of allergic children, regardless of whether the allergy is complicated by behavior problems or convulsive disorders. Irregular brain waves are predominately occipital in half of the allergic cases studied. Such occipital dysrhythmia appears twice as often in those

children with positive allergic histories as in those with negative histories. They also found the same percentage of occipital dysrhythmia in children with allergy complicated by convulsions and behavior problems as in those with allergy only. Such was not true in normal nonallergic children's electroencephalograms or in nonallergic children with convulsive disorders or behavior problems compared with the allergic group.

Of these 6 cases, one died before sufficient time elapsed for observation. Another was a hopeless epileptic to begin with and the condition was unaltered. A third, while showing improvement in her allergy, did not show any change in her epilepsy. The other 3 are instances in which therapy along allergic lines not only held the allergy under control but acted most favorably on the epileptiform convulsions.

If physicians interested greatly in epilepsy and the electroencephalograph will take a similar interest in allergy or work with an allergist, it is possible that a much greater correlation of epilepsy and allergy will be found, and more encouraging results may be secured in some cases.

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THE STATE SOCIETY OFFICERS FOR THE YEAR

In a time when there is cause to fear "the slings and arrows of outrageous fortune" the House of Delegates has chosen officers and members of committees who are men of experience, decision, and judgment. The House of Delegates and the Society are to be congratulated on the selections.

Our president, Dr. E. H. Lawson, has been on the faculty of Tulane for years and has been long in the activities of organized medicine; he was the first president of the Louisiana State Society of Pathologists; he has been on the board, secretary and president, of the Orleans Parish Medical Society. We are fortunate to have a leader with breadth of vision, composure and courage.

The new president-elect is Dr. George W. Wright. He is an eminent internist who has served as president of the Ouachita Parish Medical Society, as president and councilor of the Fifth District Medical Society, and as first vice-president of the State Society. His temperament and experience make him admirably suited for the position.

The first vice-president is Dr. Robert F. Sharp, an outstanding urologist who has been active in the Orleans Parish Medical Society for years. He was Chairman of Arrangements at the recent highly successful meeting in New Orleans. He combines a genial personality with capability and decision.

The second vice-president is Dr. Jeff McHugh. He is a well-known surgeon. He has served as president of the East Baton Rouge Parish Medical Society and has been active in the valuable Council of Medical Service and Public Relations since its inception in 1946.

The third vice-president, Dr. Jerome Landry, a well-known surgeon, has been active in the Orleans Parish Medical Society for years and brings a valued maturity of viewpoint to the Executive Committee.

Dr. A. V. Friedrichs was selected as Chairman of the House of Delegates, which position he has held most capably since 1944. His dispensation of "even-handed justice" with consideration and vision brings admiration from the whole House.

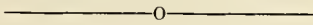
The vice-chairman of the House of Delegates, Dr. J. P. Sanders, is a founder and leader of the Academy of General Practice. He has served previously as vice-chairman and also as vice-president. He is doing admirable work for the Society in the Rural Health Council.

Our experienced and capable secretary, Dr. P. T. Talbot, fortunately remains in office to continue to serve the Society as he has for years. He constitutes a valuable and stable source of information and advice in all matters of the Society interests. His unselfishness and sincerity will long be appreciated.

We are happy that the Council is much the same as last year. There is one new elected member, Dr. J. W. Faulk, Sr., for the 7th District. Dr. Faulk has been active in organization matters in his district and will be a valuable member of the Council.

The delegates to the AMA are the same as in the past few years. Dr. J. Q. Graves and Dr. Val Fuchs will represent the Society this year capably as in the past.

As the history of the Louisiana State Medical Society shows it has needed, and fortunately has enjoyed, capable leadership through the years. The officers for the present year are worthy successors to our illustrious leaders.



WE MUST KNOW THE ANSWERS

The politicians are offering State Medicine as a gift to the people—and telling them that it is free. The responsible public, or that portion of it which still realizes you cannot get something for nothing, looks to us, the doctors, to explain our position and opposition. Accordingly, we must know the answers.

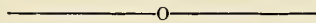
It is not enough to say we do not want it. We must explain simply and convincingly why we are against it. It is not enough for one of us to say we disregard the statistics of draft rejection and their bearing on medical care. We must state why we disagree with the interpretation of these statistics and show that the condition of only a small percentage of those individuals

rejected would have been influenced by the availability of medical care.

Explanatory discussions, whether conversational or didactic, should be our forte. We should avail ourselves of the many facts that bear on our position. The literature that was furnished by the NPC and that coming now from the AMA provides splendid equipment from which we can draw our answers. But in giving these answers facts and figures are needed to give conclusive proof. "Impressions," however valid and satisfying to ourselves, are not convincing to the public, who in turn make up the mind of Congress.

By birth, training, and education, we are not facile in public debate. In such, our position is similar to that of Churchill at the end of the war, when all he had to offer the populace was work, sweat, and austerity; while his successful opponent offered them a brave new world flowing with the good things of life. The physician debater tells the audience they have the best medicine in the world and that it is good because it is unrestricted and paid for competitively. His opponent generously offers all that for nothing. We should avoid such debates except under special conditions, and save our time and energy for audiences who are interested in discussing their ultimate medical welfare. They too want facts and figures, and they want the proper medical interpretation of these, in order to provide for their personal medical problems separate from political expediency.

Let us prepare before we speak.



ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

REPORT OF COMMITTEE ON RESOLUTIONS

On behalf of the House of Delegates and members of the State Society in attendance at the 1949 Annual Meeting it is desired that thanks be expressed to the following individuals and organizations for their co-

operation and assistance in arranging for this meeting.

Dr. Robert F. Sharp, Chairman of the Committee on Arrangements, for his interest and work in handling details of arrangements for the meeting.

The Orleans Parish Medical Society, host

of the meeting, for their efforts in planning a most interesting and entertaining meeting.

The Secretary-Treasurer of the State Society and personnel of his office for their assistance and attention in all matters in connection with this meeting.

Dr. Donovan C. Browne, General Chairman of the scientific program and the sectional chairmen, for the fine scientific program prepared.

Guests on the scientific and open meeting programs for their participation.

The press and radio stations for their cooperation incident to publicity for the meeting.

The Louisiana State Board of Medical Examiners for their annual report submitted by the Secretary.

The members of the Woman's Auxiliary who offered an interesting program and entertainment for wives of the doctors.

Commercial companies which provided exhibits.

Companies which participated by advertising in the program for the meeting.

Mr. Al Bourgeois, Manager of the Roosevelt Hotel, for cooperation in furnishing accommodations for members and guests and facilities for various sessions and social functions.

The managers of other New Orleans hotels for their splendid cooperation in handling reservations for members and guests.

The New Orleans Association of Commerce for excellent assistance at the registration desk.

Dr. A. V. Friedrichs, Chairman of the House of Delegates, for the efficient manner in which matters considered by the House were handled.

To all officers and members of the Society for their attendance and manifested interest in the meeting.

It is recommended that a copy of this report be incorporated in the minutes of this meeting and that a copy be submitted to the New Orleans Medical and Surgical Journal for publication.

COMMITTEE ON MEDICAL DEFENSE

Only one case, that of a threatened suit against a New Orleans doctor, was referred to the Committee on Medical Defense during the past year. It was the unanimous opinion of the committee that this doctor should be defended and the attorney was furnished all data in connection with the case, however nothing further has developed in regard to the suit.

The Medical Defense Fund is increasing due to receipts from yearly appropriation of fifty cents per capita from the general fund and income from securities held in the trust fund. Financial reports of the Fund are on file in the office of the State Society and may be reviewed by any member desiring to do so.

—o—

1949 ANNUAL MEETING

The 1949 Annual Meeting, held in New Orleans May 5-7, was very successful. In contrast to last year's attendance of 347 members and 43 guests, 614 members and 36 guests were present this year. The scientific program was well organized and interesting, and an outstanding highlight of the meeting was an opening session on Thursday evening. The House of Delegates functioned efficiently and managed the business before it capably and swiftly. The dinner-dance in honor of the President was one of the most attractive social affairs ever held by our organization.

Abstract of minutes of the meeting of the House of Delegates is printed herewith.

ABSTRACTED MINUTES

HOUSE OF DELEGATES

LOUISIANA STATE MEDICAL SOCIETY

There were 89 delegates, 16 officers and 12 past presidents present.

MINUTES

Minutes of 1948 meeting of House of Delegates and of meeting of House of Delegates held on February 20, 1949 approved.

Minutes of Executive Committee meetings held since 1948 meeting approved.

SPECIAL ORDER

Appointment of committees: *Credentials*—Dr. L. O. Clark, Chairman; Drs. Guy Riche, Jr. and Wm. H. Roeling. *Resolutions*—Dr. J. E. Knighton, Jr., Chairman; Drs. C. R. Daunis and J. O. Weilbaecher, Jr. *President's Report*—Dr. C. Grenes

Cole, Chairman; Drs. C. M. Horton and C. B. Odom.

List of members who died since 1948 meeting read.

Representative of Nurses Association spoke to the House of Delegates on the subject of "Nursing for the Future".

Recognition of fraternal delegate and guest: Dr. Walter D. Brown, of Beaumont; Mr. Robert Hurleigh, of Chicago.

Approval of motion that Mr. Frank Lais, Jr. be permitted to attend this meeting of the House of Delegates.

Rising vote of thanks given Drs. R. E. King and E. M. Toler for their efforts in the Legislature in behalf of the medical profession.

Doctors requested to answer letters received from Practical Nurses Board in re recommendation of practical nurses.

COMMUNICATIONS

Rapides Parish Medical Society in re minimum fee for life insurance examinations: Motion made and carried that a committee be appointed to investigate this matter and report to the Executive Committee for action.

American Association of Small Business in re resolution expressing opposition to compulsory health insurance: Motion made and carried that a vote of thanks be extended the American Association of Small Business for their cooperation with the Louisiana State Medical Society and their interest in combating compulsory health insurance; also that the House of Delegates endorse the resolution received from the American Association of Small Business.

ACTION TAKEN

Special committee appointed to consider the matter of Red Cross blood banks authorized to study this matter and report to the Executive Committee.

House of Delegates went on record as being opposed to entering into a contract with the Veterans Administration at the present time. Motion made and carried that the incoming President appoint a special committee to make further study of the Veterans Administration's proposals for an agreement with the State Society, to make a report to the House of Delegates at the 1950 meeting.

Copy of following resolution in re opposition to compulsory health insurance to be sent to members of Congress from Louisiana and to the President of the United States:

"WHEREAS, there has been proposed a plan for National Compulsory Health Insurance, and

"WHEREAS, this program is offered as a solution to obtaining medical attention for people in these United States, and

"WHEREAS, we find, through thorough investigation, that the medical profession in its

present status is making tremendous progress through volunteer and private research resulting in better care for all the people, and

"WHEREAS, we feel that it would be a serious mistake for our Government to enter into the field of medicine thereby destroying the *democratic* principle which entitles a patient to the right of free choice of physician and hospital. Such interposition would lower rather than raise the standards of the medical practice, the standard of this country being higher than those in countries using any form of Socialized Medicine, and

"WHEREAS, the general health of our nation is higher than any other nation in the world, and

"WHEREAS, the proposed program has been enacted in other countries and has been proven unsatisfactory, and

"WHEREAS, the medical profession has established a means for people to secure prepaid voluntary health insurance through BLUE SHIELD PLANS,

"NOW, THEREFORE, BE IT RESOLVED that we, the House of Delegates of the Louisiana State Medical Society do hereby vehemently oppose and object to Socialized Medicine in any and all forms, including the National Compulsory Health Insurance Program and unalterably oppose and object to our Government entering into the said field in any manner."

Invitation to hold 1950 meeting in Baton Rouge accepted.

Approval of suggestion that award to president be changed from the present medal to the form of a button which may be worn.

Executive Committee authorized to study subject of division of the Third District and make report to the next meeting of the House of Delegates.

MATTERS DISCUSSED—NO ACTION TAKEN

Statement to press stating that the Louisiana State Medical Society is heartily backing the cancer control program as outlined.

Length of time allowed for guest speakers appearing before the House of Delegates.

REPORTS OF OFFICERS AND COMMITTEES

CONTAINING NO RECOMMENDATIONS

Following reports received and filed: Secretary-Treasurer; Councilors of First, Second, Third, Fourth, Fifth, Sixth and Eighth Districts; Committees—Aid to Indigent Members, Arrangements (1949 Annual Meeting), Budget and Finance, Cancer, Congressional, Diabetes, General Practitioner Award, History of LSMS, Hospitals, Industrial Health, Journal, Juvenile Delinquency, Maternal Welfare, Medical Defense, Medical Education, Medical Testimony, National Emergency Medical Service, Nutrition, Public Policy and Legislation,

Scientific Work, Venereal Disease Control, Veterans Administration Contract and Fee Schedule.

REPORTS OF OFFICERS AND COMMITTEES CONTAINING RECOMMENDATIONS

President: 1. Study of committees—Committee to be appointed by the President to study the question of standing committees; it is felt that there is no need for a standing committee on veterans' affairs. 2. Continued active support of Louisiana Physicians Service, Hospital Service Association of New Orleans and Louisiana Hospital Service—(see action on report of Louisiana Physicians Service, Inc.). 3. Active support of AMA by payment of twenty-five dollar assessment; also support of their program—Approved. 4. More active interest in rural health problems—Approved. 5. Survey of facilities and personnel for medical care in the state by State Society with the idea of formulating a definite long-range program—Planning Board, composed of members of the State Medical Society to be appointed by the President to carry out this recommendation.

Council: 1. It is recommended that the House of Delegates condemn accepting or giving of rebates in the practice of medicine and instruct local societies to report such infraction of the Council—Approved. 2. If the above recommendation is approved by the House of Delegates it is further recommended that a copy of same be forwarded to each member of the Society together with pertinent information on this subject—Approved.

Councilor of Seventh District: 1. That annual conferences, similar to the ones conducted by the Seventh District Medical Society, be held in every district in the state—Approved.

Committee on Cancer: 1. That the State Medical Society should revive its interest in and assume a leading role in the Cancer Control Program of Louisiana—Approved. 2. That the State Medical Society should assist in every possible way in making "Every Doctor's Office a Cancer Detection Center", an actuality as well as slogan—Approved. 3. That the State Medical Society Cancer Committee be authorized to plan and set up in collaboration with our two universities, the State Department of Health and the Louisiana Division of the American Cancer Society, a course in post-graduate cancer education to be conducted at various centers in the state throughout the year rather than as review courses conducted at our university medical centers—Approved. 4. That the establishment of Tumor Clinics and Tumor Registries be set up through the auspices of component parish and district cancer committees

throughout the state wherever the requirements for such clinics and registries can be met—Approved.

5. That the Cancer Committee be enlarged to include the chairman of each component parish or district society committee and that an executive committee, consisting of the chairman of the state cancer committee and eight members appointed by the chairman shall be empowered to transact the business of the committee as a whole—Approved.

6. That the Louisiana State Medical Society allocate the sum of \$2,000.00 for the purpose of implementing the program as outlined above—Approved.

Committee in re Licensure Law for Hospitals:

1. That further efforts be made at the next session of the Legislature to have a bill on hospital licensure enacted into law.

Committee on Mental Health: 1. Membership of the Committee on Mental Health be carried on overlapping terms—Approved. 2. Approval of steps in organization of mental health services in Louisiana, as described in report—Approved. 3. A merit system be established in all mental health agencies in order to make them eligible for federal funds—Action on recommendation postponed indefinitely. 4. Louisiana State Medical Society be consulted with reference to location and plans for mental health hospitals and other facilities—Approved. 5. Effort to have statutes making it possible for a layman to be appointed superintendent of a Louisiana mental hospital repealed and to provide instead that these positions be filled by a physician, preferably experienced in dealing with mental disease and licensed or eligible for license to practice medicine in the State of Louisiana—Approved. 6. Reaffirm approval of report offered by Dr. Sam Hamilton in 1941—Action on this recommendation deferred. 7. Louisiana State Medical Society go on record as condemning type of newspaper publicity recently given to the deficiencies of the state mental hospitals and that every newspaper in the state be so informed—Action on this recommendation deferred. 8. Louisiana State Medical Society advise authorities responsible for investigation of mental hospitals or schools that the services of its membership where technical advice on such matters is indicated are available provided such investigations are for constructive purposes—Action on this recommendation postponed. 9. United States Public Health Service funds be utilized at present for training of people to man community mental health facilities—Action on this recommendation deferred. 10. Psychiatric papers should be included in the program of the annual meeting of the State Society; papers to relate more directly to the practice of

medicine and given in connection with that portion of the program to which they relate rather than set apart as a special section—Approved.

Committee on Rearrangement of Annual Meeting Programs: 1. No fixed or rigid rules or plan should be placed in the By-Laws as to the detailed arrangement and plan of the scientific program—Approved. 2. The first day of the scientific session should, for the time being, be conducted as a symposium—Action on this recommendation deferred. 3. The organization and inclusion of the specialty groups as a part of the State Medical Society program should be continued—Action on this recommendation deferred. 4. A trial third day should be added to the scientific program and devoted to two general sessions; possibly the general practitioner might be incorporated in the program on this day—Action on this recommendation deferred. 5. Present plan of appointing a general chairman to assume responsibility for the program is a necessity—Action on this recommendation deferred. 6. The present plan of appointing chairmen for the various sections should be continued—Approved. 7. Selection of the guest speaker for the opening night session should remain a courtesy to the President—Approved. 8. This committee should be continued in order to carry on possible improvement of scientific programs—Action on this recommendation deferred.

Committee on Resolutions: 1. That a copy of this report be incorporated in the minutes of this meeting and that a copy be submitted to the New Orleans Medical and Surgical Journal for publication—Approved.

Committee on Rural Medical Service: 1. It is recommended that this committee be continued and that it be given more authority to handle rural medical problems—The situation in regard to the Rural Medical Service Committee to remain as in the past. 1. (supplemental report) Part of the education of an intern be to have him serve at least six months in a rural area where doctors are needed. Either having the community needing a doctor furnish an equipped office or having the state build offices for doctors to practice in these rural areas, making it possible to receive consultation either with other doctors belonging to organized medicine, in neighboring communities, or the hospital staff of which he is a member; also that he be paid fees for services rendered and such fees be fixed as to the prevailing fees of that community; also that an effort should be made that such a training should be a prerequisite to a residency in any hospital or at least any state hospital—Action on this recommendation deferred. 2. A

committee be appointed to receive applications from rural communities in need of a doctor and that this committee investigate the community as to its advantages for a young doctor settling there. Investigate accessibility to roads, schools, churches, water, electricity and gas, also the ability of such a community to support a doctor—Approved.

REPORT OF COUNCIL ON MEDICAL SERVICE AND PUBLIC RELATIONS

Recommendations included in this report acted upon as follows: 1. A committee be appointed in each medical society to implement the national and state programs and that the chairman of each parish committee serve as a member of the Council on Medical Service and Public relations. The district members appointed by the president of the State Society should form the Council's executive committee—Approved. 2. Budget of the Council be considered—Motion made and carried that appropriation to the Council be increased as much as it is conservatively possible to do so.

REPORT OF LOUISIANA PHYSICIANS SERVICE INC.

This report contained a statement that the Board of Louisiana Physicians Service, Inc. considered the question of merger as presented by the Louisiana Hospital Service at a Board Meeting held on Friday, May 6 and that the Board voted against approval of proposal as presented. It was also stated in this report that the Board reaffirmed the following basic principles on which organization of LPS was based and directed that the State Medical Society be apprised of this action: 1. There shall always be sponsorship and active control of Louisiana Physicians Service by the Louisiana State Medical Society. 2. There shall always be retained the service feature of our contract for the low-income subscriber group. 3. Louisiana Physicians Service must always remain statewide in its scope. Motion was made and carried that the report submitted by LPS be accepted.

REPORT OF LOUISIANA STATE BOARD OF MEDICAL EXAMINERS

Report, as presented by Secretary of the Louisiana State Board of Medical Examiners accepted.

REPORT OF LOUISIANA STUDY OF CHILD HEALTH SERVICES

Recommendations contained in the report of the Louisiana Study of Child Health Services were

acted upon as follows: 1. That the House of Delegates officially receive the report of the Louisiana Study of Child Health Services—Action on this recommendation deferred until after the June meeting of the American Medical Association after which time the Executive Committee or House of Delegates can take action. 2. That the House of Delegates approve of the formation of statewide and local Child Health Councils and instruct the proper committee to assume responsibility, alone or jointly with the Louisiana State Pediatric Society, for the formation of such councils, in order that this study may become an instrument toward continuing improvement in the health of our children—Action on this recommendation deferred until after the June meeting of the American Medical Association after which time the Executive Committee or House of Delegates can take action.

REPORT OF PAST PRESIDENTS OF STATE SOCIETY

The report of Past Presidents of the State Society contained three resolutions which were acted upon as follows: 1. WHEREAS, the Hon. Allen J. Ellender, Senior Senator for Louisiana, has made a firm stand as one of the chief opponents of the Truman Health Plan, and Socialistic programs in general; THEREFORE, BE IT RESOLVED: that we, the Past Presidents Society of the Louisiana State Medical Society recommend to the House of Delegates, that a vote of appreciation and thanks be given to Senator Ellender for his wisdom and courage in recognizing the need of private enterprise and for exposing the fallacies of the proposed regimentation of the medical profession; and BE IT FURTHER RESOLVED: that a copy of this Resolution be sent to the Senator during the session of our Society—Motion made and carried that the resolution offered by the Past Presidents be adopted and that telegrams be sent to Senator Ellender and to other members of Congress who have expressed opposition to compulsory health insurance. 2. WHEREAS, The Louisiana State Medical Society is composed largely of physicians in General Practice, and that in the past much of the programs were of little interest to the general practitioners; RESOLVED: That in the formation of future programs for the sessions of the Louisiana State Medical Society greater emphasis be given to papers of interest to the general practitioner and that another day be added to the length of the meeting, if necessary:—Adopted. 3. WHEREAS, Recently solicitations were made for funds from members of the Medical Society to finance a special supple-

ment in one of the newspapers, and said solicitations were made in the name of a committee of the Louisiana State Medical Society; and WHEREAS, the Secretary and personnel of the Secretary's office were unaware that such solicitations were being made; and WHEREAS, the Secretary should be cognizant of all activities being promulgated in the name of the Society, THEREFORE, BE IT RESOLVED: that all publicity, advertising, and activities purporting to come from the Louisiana State Medical Society must receive the sanction of the President and Secretary before being released for publication—Adopted.

ELECTION OF OFFICERS, COMMITTEES AND DELEGATE AND ALTERNATE TO AMA

President-elect—Dr. George Wright, Monroe

First Vice-President—Dr. Robert F. Sharp, New Orleans.

Second Vice-President—Dr. Jeff McHugh, Baton Rouge

Third Vice-President—Dr. Jerome Landry, New Orleans

Chairman, House of Delegates—Dr. A. V. Friedrichs, New Orleans

Vice-Chairman, House of Delegates—Dr. J. P. Sanders, Shreveport

Councilor, Third District—Dr. Guy R. Jones, Lockport

Councilor, Fifth District—Dr. C. P. Gray, Jr., Monroe (unexpired term of Dr. George Wright)

Councilor, Sixth District—Dr. W. E. Barker, Jr., Plaquemine

Councilor, Seventh District—Dr. J. W. Faulk, Sr., Crowley

Councilor, Eighth District—Dr. O. B. Owens, Alexandria

Committee on Journal—Dr. Sam Hobson, New Orleans (3 year term)

Committee on Medical Defense—Dr. Kelly Stone, New Orleans (3 year term)

Committee on Public Policy and Legislation—Dr. R. B. Harrison, Chairman; Drs. C. Grenes Cole, Edwin H. Lawson and P. T. Talbot, all of New Orleans; Dr. King Rand, Alexandria.

Committee on Scientific Work—Dr. P. T. Talbot, Chairman; Dr. W. H. Gillentine, both of New Orleans; Dr. J. E. Knighton, Jr., Shreveport

Delegate to AMA (1950 and 1951)—Dr. J. Q. Graves, Monroe

Alternate to Delegate to AMA (1950 and 1951)—Dr. A. A. Herold, Shreveport.

LOUISIANA STATE MEDICAL SOCIETY NEWS

C A L E N D A R

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
East Baton Rouge	Second Wednesday of every month	Baton Rouge
Morehouse	Second Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

THE BRITISH EXPERIMENT IN SOCIALIZED MEDICINE

Hear first hand reports at the Conference of Presidents and Other Officers of State Medical Associations on Sunday, June 5, in the afternoon, at the Rose Room, Hotel Traymore, Atlantic City.

Let Cecil Palmer, English publisher, Author and Journalist, a signatory of the famous "Manifesto on British Liberty", tell you what Socialism is doing to British Freedom. Mr. Palmer is now on tour of the United States, and his addresses have stirred audiences everywhere.

Let W. Alan Richardson, Editor of Medical Economics, recent visitor to England to study the doctors' problems under compulsory national insurance, tell you how the system is working as it finishes its first year of operation.

Don't miss this meeting! Check the date and time now.

The Executive Committee
Conference of Presidents and Other Officers
of State Medical Associations

THE AMERICAN CONGRESS OF PHYSICAL MEDICINE

Will hold its twenty-seventh annual scientific and clinical session Sept. 6, 7, 8, 9 and 10, 1949 inclusive, at the Netherland Plaza Hotel, Cincinnati, Ohio. Scientific and clinical sessions will be given on the days of Sept. 6, 7, 8, 9 and 10, 1949. All sessions will be open to members of the medical profession in good standing with the American Medical Association. In addition to the scientific sessions, the annual instruction courses will be held Sept. 6, 7, 8 and 9. These courses will be offered in two groups. One set of ten lectures will consist of basic subjects and attendance will be limited to physicians. One set of ten lectures will be more general in character and will be open to physicians as well as to physical therapy technicians who are registered with the American Regis-

try of Physical Therapy Technicians. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

EVANGELINE PARISH MEDICAL SOCIETY

At its regular meeting on April 26, 1949, the Evangeline Parish Medical Society elected the following officers to serve for the coming year:

Dr. C. L. Attaway of Ville Platte—President

Dr. E. R. Dupre of Ville Platte—Vice-President

Dr. Gordon E. Soileau of Ville Platte—Secretary-Treasurer.

AMERICAN ACADEMY OF GENERAL PRACTICE

The March meeting of the Orleans Chapter of the AAGP was a dinner-meeting held at Lenfant's Boulevard Room. There was a large attendance.

Dr. Eli H. Rubin, Professor of Clinical Medicine of New York Medical College, gave a most interesting talk on "The Lung As A Mirror of Systemic Disease." He used many X-ray slides to demonstrate the lung findings. Dr. Edgar Hull, Professor of Medicine at L. S. U. Medical School, an honored guest, participated in the discussion.

The April meeting was held on May 29 at the Tulane Hutchison Memorial Building. The guest speaker was Dr. Lawrence J. O'Neal who presented a talk on "The Acute Abdomen". He stressed the importance of history and physical examination, including a careful observation of the patient and auscultation of the abdomen for diagnosis. He then outlined the procedures to be taken in any case of acute abdomen prior to operation.

The Orleans Chapter of the AAGP wishes to express its thanks to the above speakers for their presentation of such instructive talks before its membership.

NEWS ITEM

Dr. William L. Bendel was the winner of the third annual *News-Star-World* award as Monroe, La.'s "good citizen" for 1948.

The honor, bestowed for meritorious civic service, was awarded Dr. Bendel for services rendered to the youth of Monroe. Always interested in the youth of the city and a foremost follower of sports, Dr. Bendel's assistance to the athletes of Northeast junior college, Ouachita Parish High school, Neville High school, and his contributions in professional service to the Boy Scouts of America in their annual summer encampment at Camp Ki-Ro-Li won for him this distinction.

REGIONAL CONFERENCE ON LOCAL HEALTH UNITS

Under the auspices of the National Health Council and in cooperation with the State Departments of Health in Arkansas, Kansas, Missouri, Louisiana, and Oklahoma, a conference was held April 20-22, 1949, at the Hotel Continental, Kansas City, Missouri, and was attended by about 75 to 100 members from the five states—public health officers, general practitioners in medicine, farm bureau representatives, nurses, school teachers, and representatives from almost every organization interested in public health. The conference was unique in several respects. At the initial meeting on Wednesday afternoon, April 20, the conference set up its own rules and regulations for carrying on its work. It broke up into state groups and these outlined the problems existing in public health in their territories. The problems of each state were brought back into the conference next day and presented as a whole. These were then grouped together and reclassified under the following headings: (1) Finance; (2) Coordination; (3) Personnel; (4) Legislation; (5) Education.

Five groups then assembled in different meeting places for the separate discussion of each of these topics and the conference members were assigned to the group they wished to attend. I was particularly interested in the legislative group. Other members of the Louisiana delegation attended other sections. Each state group discussed the solution of its specific problems and brought back recommendations to the general conference for discussion.

On Friday morning the state groups reassembled and tried to work out these problems relative to their own state. The following were the recommendations of Louisiana.

1. That the basic law of Louisiana be changed to permit local health areas to tax themselves for the maintenance of health units.

2. That the State Department of Health, its officers and personnel be taken out of the realm of politics. That a definite merit system be insti-

tuted and that the various departments operate without political interference.

3. That an intense educational campaign be carried on through all organizations interested in public health. It was decided by the Louisiana delegation that since the Louisiana Rural Health Council was already set up, and that since within its organization was included every representative group in Louisiana, it would be the one to spearhead this campaign.

One of the important developments of the meeting was to view with disfavor, subsidies or grants-in-aids of any sort from the Federal Government. It was pointed out that if the states themselves could obtain their own tax money, they would have a sufficient amount to carry on their work. Forty to fifty percent of all taxes are now wasted in making trips to Washington and back. The group felt that certainly at present it will have to accept subsidies, but as a long range program it will probably be best to discontinue them.

The National Health Council is an organization of long standing, founded in 1904, but for a long time it was practically dormant. It has recently been revived, and in March of this year the American Medical Association readmitted it as a member. It is composed of most of the agencies now included in our Rural Health Council. It is a non-partisan organization and is working on a national level to encourage the promotion of health. The representative in Kansas City was Dr. Haven R. Emerson, now treasurer of the National organization, formerly Professor of Public Health at Columbia University and health officer of the City of New York.

J. P. Sanders, President-elect,
Louisiana Rural Health Council.

LEONARD CLARE CHAMBERLAIN
1877-1949

Dr. Leonard Clare Chamberlain died on April 28, 1949. He was a member of the Orleans Parish Medical Society and held membership in the State Society since 1914. Dr. Chamberlain was a graduate of Tulane Medical School in 1901. Since 1948 he retired and made his residence in Bay St. Louis, Miss.

WCMAN'S AUXILIARY, LOUISIANA STATE MEDICAL SOCIETY

President's Annual Report, 1948-1949

As President of the Woman's Auxiliary to the Louisiana State Medical Society it is my privilege to submit the following report.

Health and education have been the keynotes of the Auxiliary program for the year 1948-1949, and the plan of work has been based on the following:

1. Education of Auxiliary members and educa-

tion of the laity through a study of Auxiliary and other related publications, open forums, panel discussions, lectures, and study groups on the subject of Blue Shield, federalized medicine, medical legislation and the health of the nation. We are alert to the fact that the opinions of a doctor's wife are held in high esteem and that those opinions must be based on accurate knowledge.

2. Assistance with the program of the Council on Medical Service and Public Relations of the State Medical Society, to promote an educational campaign for better relations between doctors and the laity.

3. Work toward the organization of health councils for the improvement of school health services as sponsored by the National Auxiliary.

4. Sponsoring and editing the state Auxiliary publication, "News and Views"; a concise Auxiliary textbook to help keep the membership informed on topics of the day, facilitate the work of the Auxiliary, and present the gravity of the situation in which organized medicine finds itself today.

5. Organizations of new auxiliaries and reactivating those disbanded.

6. Promotion of *Hygeia*, and of the national bulletin of the Woman's Auxiliary; recruiting of nurses; cancer control, tuberculosis control, periodic health examinations; and the support of the Jane Todd Crawford Student Nurse Fund.

7. Collection and preservation of medical cultural items.

8. Promotion of the Commemoration Fund used to help indigent widows of doctors.

9. Observance of "Doctor's Day".

Several new chairmen were added to the list of standing committee chairmen this year, including rural health and nurse recruitment. A Council on Auxiliary Services was organized last summer, composed of a representative from each district, the state president and state program chairman. This Council in July took part in a round-table discussion with the Council on Medical Service and Public Relations of the State Society in discussing problems confronting the medical profession and proposed ways of solving these problems. As you know the Council on Medical Service and Public Relations of the Louisiana State Medical Society is considered one of the best in the United States and our Auxiliary was most fortunate in being given the privilege of this service in open discussion. We hope this will develop into an annual conference between the two councils in their efforts to do the best job possible in all medical and Auxiliary problems.

Our paramount effort this year has been directed against the socialization of medicine, the first step in the socialization of America. Our job is to continue to mobilize our forces within the Auxiliary to bring the truth to Americans whose voices can be raised in concerted effort against

compulsory health insurance. The medical profession and the Woman's Auxiliary are taking the lead in this fight because the politicians have thrust this problem upon us. We are taking the lead, not only to save American free medicine, but to save all of America from further bureaucracy and complete socialization. All of this and other pertinent legislation before Congress has alerted the chairman on legislation, who has been and is doing a splendid job in providing the needed information. Study "News and Views" with your husband and then pass it on to a friend. It is prepared for the laity as well and always contains pointers on legislation. The assistance of the Public Relations Chairman has been of unestimated value to us in providing literature, counsel and general direction in this endeavor.

The Bulletin Chairman reports 90 subscriptions from Tangipahoa, the only Auxiliary with 100 per cent. *Hygeia* subscriptions number 215, Ouachita reporting 70 subscriptions. Some of these were gifts to institutions. A *Hygeia* contest in the parish schools is sponsored each May by Calcasieu. Jefferson Davis Auxiliary gave subscriptions to two high school libraries. Iberville has sent in 15 subscriptions. East Baton Rouge encouraged *Hygeia* sales by distributing sample copies at their meetings. Rapides sent in 25.

The organization reports show an over all increase in membership from 812 in 1948 to 900 in 1949. There are on the roster 906 paid memberships, 5 honorary and 1 associate.

Vernon Parish has become inactive. The North Central Auxiliary at Ruston has been inactive all year due to illness of its leaders, but they are beginning to work again. Bogalusa is now fully activated after an inactive period. Lafayette is active again. Your president met with them in June, 1948 for their second meeting after reorganization. There are 17 active Auxiliaries in the Second District. Mrs. P. A. Donaldson, councilor for the Second District, has this year secured 18 memberships at large, made talks to church and social groups, provided editorials to local papers against federalized medicine, mailed literature to local citizens, sponsored talks on juvenile delinquency and the Jane Todd Crawford Student Loan Fund, besides speaking to high school graduates on nursing and writing an editorial in the local papers on "Doctor's Day". What an example of individual Auxiliary work. Do not become discouraged if you are not a member of an organized, active group. After all, this job is a person-to-person affair, with each woman accepting her job. Remember that a doctor's wife is a privileged person, and with privileges come responsibilities that she will not fail to discharge creditably.

The Auxiliary has entered into various activities in behalf of cancer control: bandage making; workshop attendance; showing of cancer films; forums; fund drives; and serving as officers in

their respective local organizations. Shreveport, alone, has given over 1000 hours to cancer control work, making over 17,000 cancer dressings. Alexandria has a splendid record on bandage making. Shreveport's speakers bureau has been responsible for talks to thirty civic, religious and social groups.

The sum of \$211.97 has been added to the Commemoration Fund and \$25.00 to the J. T. Crawford Student Nurse Fund.

"Doctor's Day," March 30th, was observed in various ways by active auxiliaries throughout the state. The historian had on display at the convention a unique book depicting the history for the year—although not all of you provided the requested material.

We are constantly searching for medical cultural items, and our state chairman provided a splendid exhibit at the convention.

The press and publicity chairman has been alert in providing news and informative articles on Auxiliary activities each month to the New Orleans Medical and Surgical Journal. She has also kept parish publicity chairmen informed on the ever important job of proper publicity.

Our program chairman has effectively counseled and guided in the work of the various projects sponsored by the State Auxiliary. While each parish auxiliary probably cannot sponsor all projects, each can fit the program to the community's pattern and needs.

The Year Book chairman provided the Auxiliary roster with addresses and material for the October issue of the Journal of the State Medical Society.

Other interests and activities of the Auxiliary include helping with chest x-rays in the tuberculosis program, organizing blood banks, (Shreveport Auxiliary); collecting good used clothing for medical students (New Orleans Auxiliary); starting of a loan closet by the Iberia Auxiliary, where wheel chairs, hospital beds, crutches and sick room needs are collected and furnished to the Parish Health Unit. The Iberville Auxiliary sponsored two boys and two girls to Pelican State in Baton Rouge, at a cost of \$125.00.

The national officers have been a source of inspiration and personal encouragement through the year. The Executive Board and the membership as a whole have given me unstinted support. I could wish that all of you might read the reports of work done which are now in my file. Time and space do not permit me to go into full detail.

I am profoundly grateful to all of you for a helpful and a profitable year. I should like to express my sincere thanks to the President and Secretary-Treasurer of the Louisiana State Medical Society, Dr. Hargrove and Dr. Talbot; to the members of the Advisory Board, (Dr. Forsyth, now deceased), Dr. Grey and Dr. Murphy, for guidance and courtesy in helping to solve Auxiliary problems; to Dr. Friedrichs and Mr. Lais and the

Council on Medical Service and Public Relations for publishing and mailing the official Auxiliary publication, "News and Views".

Mrs. O. B. Owens, President,
Woman's Auxiliary to the Louisiana
State Medical Society.

CONVENTION OF WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

The annual meeting of the Woman's Auxiliary to The Louisiana State Medical Society was held in New Orleans, May 5-7. It was in conjunction with the 69th annual conference of the Louisiana State Medical Society.

Registration began on Thursday morning, at the Roosevelt Hotel, which was the headquarters for the convention. That afternoon a pre-convention Executive Board meeting was conducted by the President, Mrs. O. B. Owens, of Alexandria. The invocation was given by Rev. B. C. Taylor of Rayne Memorial Methodist Church.

On Thursday evening, the Auxiliary members joined their husbands in attending the opening meeting of The Louisiana State Medical Society in the Grand Ball Room.

The general session of the Auxiliary took place on Friday, Mrs. Owens presided. Rev. William Crandell, S. J., of Loyola University gave the invocation, and Rabbi Leo Bergman, of Touro Synagogue, the benediction. Mrs. Edwin A. Socola, the President of the Orleans Parish Auxiliary, welcomed the assembly and Mrs. Arthur D. Long, Baton Rouge, made the response. Mrs. Lloyd J. Kuhn, of New Orleans, read the In Memoriam.

Greetings were brought by the President of the State Society, Dr. M. D. Hargrove, Shreveport, and by the President-elect, Dr. Edwin H. Lawson, New Orleans, as well as by Dr. J. Kelly Stone, President of Orleans Parish Society. The general chairman of the convention, Dr. Robert F. Sharp, also brought greetings, as well as did Dr. Paul T. Talbot, Secretary-Treasurer of the State Society.

Mrs. Luther H. Kice, of Garden City, Long Island, New York, was an honored guest. She is President of the Woman's Auxiliary to the AMA. In her stimulating address, she emphasized the Auxiliary's interest in rural health and stated that Auxiliary members have helped create a better understanding as to the need of public health units. There is a great need for us as Auxiliary members to read not only the Bulletin, AMA, and State Journals, but also *Hygeia*. *Hygeia* gives constructive information on health subjects and interprets the viewpoint of the medical profession on medical-social matters. We Auxiliary members should strive to make the publication better known to the general public, according to Mrs. Kice. In our own communities, we should not be content with having subscriptions to *Hygeia* from such traditional sources as school and public libraries,

doctors, etc. In addition, we should seek to reach new sources where the public reads periodicals—such as in beauty shops—in order to acquaint a larger section of the public with *Hygeia*.

Emphasis was placed by Mrs. Kice on the imperative need for public relations work both individually and collectively. If compulsory health insurance is to be defeated, there must be continuous activity on our part in our own communities. In this connection, it is to be noted that subsequently the Auxiliary passed a resolution of disapproval of compulsory health insurance. The resolution was to be sent to President Truman, with copies to go to our senators and representatives.

Mrs. Joseph W. Kelso, Oklahoma City, was introduced as another honored guest and as President, Woman's Auxiliary to the Southern Medical Association. She discussed the three objectives of S. M. A. namely, (1) research and romance in medicine, (2) support of the Jane Todd Crawford Fund, and (3) Doctor's Day. She also told of a memorial student loan fund, sponsored by S. M. A., for doctors in the Southern States who wish to do post-graduate work.

The general session proceeded with reports of State officers, Parish presidents and special committees. Mrs. Arthur A. Herold, Shreveport, and Mrs. George Feldner, New Orleans, gave reports, respectively, on the Woman's Auxiliary to AMA and Woman's Auxiliary to S. M. A. There followed the transaction of business and the election of officers. The latter were then installed by Mrs. J. W. Warren, of New Orleans. A buffet

luncheon was served by the Orleans Parish Auxiliary.

The lovely Orleans Club was the scene of a tea and style show in honor of the incoming president, Mrs. John S. Dunn, of New Orleans. On Friday evening, the Auxiliary members enjoyed the Louisiana State Medical Society's dinner-dance and President's Reception.

The post-convention Executive Board meeting was held on Saturday morning, and following it, there was a luncheon for all auxiliary members at the beautiful New Orleans Country Club. Mrs. George J. Taquino was the toastmistress. The luncheon climaxed two days of a stimulating convention. To the Orleans Parish Auxiliary credit is due for having made the conference a successful one. Special mention should be made of the work done by the general chairman, Mrs. C. Grenes Cole, and her vice-chairman, Mrs. Roy B. Harrison and Mrs. Robert F. Sharp.

The chairmen of the subcommittees were: Mrs. Carroll F. Gelbke, registration; Mrs. Eugene Countiss, information; Mrs. Robert Kelleher, publicity; Mrs. John Sanders, telephone; Mrs. Dan Silverman, transportation; Mrs. Daniel J. Murphy, tickets; Mrs. C. L. Peacock and Mrs. Aynaud Hebert, flowers; Mrs. Boni DeLaurel, tea; Mrs. Hyder F. Brewster, luncheon; Mrs. Paul G. La-Croix, tea girls; Mrs. Joseph E. Brierre, printing; Mrs. Morgan Loyns, pages; Mrs. Joseph Ciolino, finance.

Mrs. Daniel M. Kingsley
Chairman of Press and Publicity
Woman's Auxiliary to the
Louisiana State Medical Society.

BOOK REVIEWS

Hematology: By Cyrus C. Sturgis, M. D., Springfield, Charles C. Thomas, 1948. Pp. 915, pl. illus. Price, \$12.50.

This well documented volume deals with the diseases of the hematopoietic system in twenty-three chapters. The book does not give technical diagnostic methods. The last two chapters deal with the subjects of sternal marrow biopsy and blood transfusions in considerable detail. The authors have succeeded in condensing and selecting the available information about the diseases of the blood and hematopoietic organs, without omitting any important or even rare condition. Of interest is the historical paragraph that accompanies the discussion of each condition in the text. All important statements are backed by very carefully compiled bibliographical references. The references are numbered in the text and placed at bottom of the pages, which facilitates the reading considerably. Also, at the end of the volume there is a complete list of all the references made in the

text, but arranged in alphabetical order by author. This book is recommended as a valuable reference volume in hematology.

G. M. CARRERA, M. D.

Clinical Diagnosis by Laboratory Methods: By James C. Todd, Ph. B., M. D., and Arthur H. Sanford, A. M., M. D., 11th ed. Philadelphia, 1948. Pp. 954, pl. illus. Price, \$7.50.

Like other fields of medicine, clinical pathology is getting beyond the scope of single comprehensive or condensed books. "Clinical Diagnosis by Laboratory Methods" has been a standard reference volume in clinical laboratories for many years. The present edition consists of twenty-one chapters in which the authors include practically all the accepted methods in current clinical laboratory practice, plus a few new methods in controversial subjects. The chapters on medical mycology and on viruses and rickettsias do not cover those subjects with the completeness that would appear de-

sirable, but then again these highly specialized fields would require much more space than that allotted in this volume, if an attempt at fairly thorough coverage of diagnostic procedures were to be made. The present edition has been enriched by the addition of new color plates and illustrations.

Before going into the details of the various techniques throughout the book, the authors present a brief discussion of the diseases or conditions to which the diagnostic tests are applicable, or sometimes make a few remarks of general interest but which do not add materially and specifically to the techniques in question. These statements without exact bibliographical references do not mean much to the investigator, so considerable space is partially wasted which could have been saved or utilized in giving more detailed and specific information or new tests.

The appendix at the end of the volume has a practical Index-Outline of Laboratory Findings in Important Diseases, that may help beginners until they become thoroughly familiar with the contents of the book.

G. M. CARRERA, M. D.

Experimental Immunochemistry: By Elvin A. Kabat and Manfred M. Mayer. Springfield, Ill., Charles C. Thomas, 1948. Pp. 575, illus. Price, \$8.75.

This is a manual for chemists, physicists, and biologists who use or could use immunochemical methods in their laboratories. These methods, applied to immunology from special fields of chemistry, physics, and biology, are brought together here with introductory and background material for students and others.

A comprehensive textbook of immunochemistry is yet to be written. This book limits itself mainly to experimental methods and gives little space to arguments on the mechanisms of immune reactions, antibody formation, etc. Since Michael Heidelberger was "obstetrician" to this book and the authors have been exceptionally productive in immunochemistry, we can be sure of its authority.

Almost a third of the volume is taken for introduction and description of the general methods, materials, and reactions of immunology. About ninety pages describe the application of quantitative methods to solution of immunologic problems. Another third describes chemical and physical methods useful in immunochemistry. Another ninety pages give representative methods for the preparation and purification of well-known antigens as well as for the purification of antibodies.

Experimental Immunochemistry will conveniently bring quantitative immunology and its tagged molecules, heretofore principally tools of bacteriology, to fields where they have not been well exploited.

PAUL DONALDSON, M. D.

Medullary Nailing of Küntscher: By Lorenz Böhler, M. D., First English Edition revised by the author, Translated from the Eleventh German Edition by Hans Tretter, M. D., Baltimore, The Williams & Wilkins Company, 1948. Pp. 386, illus. Price, \$7.00.

This is a careful evaluation of the Küntscher method of treating fractures of the long bone by using the medullary nails, written by one of the outstanding fracture surgeons of the world. The opinions stated in this translation are based on the personal treatment of thousands of fractures, (600 by medullary fixation) and are of especial importance because of the author's broad experience and his definite and concise discussion of the indications and contra-indications of the various techniques.

Dr. Böhler states that "Küntscher's medullary nailing is an astonishing and important innovation in traumatic surgery. With careful selection of cases and proper technique it is superior to all previous methods for the treatment of fresh closed fractures, especially those of the femur."

Böhler's evaluation of the cases in which failure of the method has occurred is of special interest to the fracture surgeons in America, many of whom have adopted medullary nailing with great enthusiasm. Böhler stresses the fact that medullary nailing cannot be used without careful evaluation of the patient's general condition or with disregard of the fundamental principles of fracture treatment. The detailed discussion of the circumstances which have lead to serious complications from the use of this method is probably the most valuable portion of this book.

The book is an excellent translation of the German and anyone dealing with fractures will be extremely interested in Böhler's careful evaluation of the Küntscher method of treating fractures of the long bone.

JACK WICKSTROM, M. D.

Neuroradiology: By Alexander Orley, M. D., F. F. R., D. M. R. & E. Springfield, Ill., Charles C. Thomas, 1949. Pp. 421, illus. Price, \$11.50.

This volume fills a void that has been recognized by the roentgenologist, neurologist and neurosurgeon. Particular attention has been devoted to technic and radiographic positions by the text, photographs and reproductions of roentgenograms. The temporal bone, sphenoid sinuses, sphenoidal fissure and cranial foramina are considered separately and the anatomy and special technics necessary to visualize these areas adequately are discussed.

The cranial bones and the cranium are covered under the headings of traumatic lesions, systemic diseases, intracranial deposits and increased intracranial pressure. Considerable space has been devoted to the cranial and cerebral circulation, the technic of arteriography and the alterations of the

normal arteriogram by lesions of the blood vessels and by cerebral neoplasms.

Cerebral neoplasms are discussed as gliomas, parasellar lesions, meningiomas, acoustic nerve tumors, congenital tumors, vascular tumors, metastatic tumors, tuberculomas and abscess. Considerable space has been allotted to the technics, the anatomical details and the interpretations of ventriculograms and encephalograms but the reader is left with the desire of an entire volume devoted to these subjects alone. The various intracranial lesions are considered and excellent line drawings illustrating the roentgenograms in clinical cases are included. The authors selection of cases has been comprehensive and instructive.

The last sixty-five pages of the text are devoted to the spine and spinal cord. Traumatic lesions, neoplasms and prolapse of the intervertebral disc and their effects on the roentgenogram and myelogram are discussed in detail. A limited but classified bibliography, an author's index and a subject index complete the volume.

In general, this volume should be available as a reference to any physician interested in neuroradiology. It should be studied carefully by the roentgenologist, the neurologist and the neurosurgeon. The text is well written and the illustrations are excellent except for some loss of detail in the darker reproduction of roentgenograms.

J. N. ANÉ, M. D.

Symptoms in Diagnosis: By Jonathan Campbell Meakins, C. B. E., M. D., D. Sc., LL.D. Baltimore, William & Wilkins Company, 1948. Pp. 542. Price, \$7.50.

This is the second edition of a text designed as a monograph dealing with the practical aspects of symptomatology. This presentation is based upon the concept that it is essential to understand the fundamental mechanisms involved in the production of the physical and emotional disturbances of the individual if the symptomatology of disease is to be fully evaluated.

The present revision recognizes the significance of the emotional components of disease, treating this material in each of two chapters. One on the Nervous System, written by Dr. Francis I. McNaughton, includes an extensive discussion of pain and headache as well as a consideration of the symptomatology of other disturbances of sensation, consciousness, and motor functions. Another chapter is on Symptoms in Psychiatry, by Dr. Karl Stern, presenting a constructive discussion of the mechanisms involved in the symptomatology. Unfortunately, practically all of the consideration of the emotional components of illness are concentrated in these two chapters, the remaining eight chapters, arranged according to anatomic systems,

not relating the symptomatology, personality patterns and the systems involved.

These eight chapters include one on the Skin, and the Skeletal, Gastro-Intestinal, Respiratory, Circulatory and Genito-Urinary systems. A well illustrated chapter on ocular symptoms and signs written by Dr. John V. Nicholls, is included. The material throughout the book is presented briefly and practically, with no attempt to be encyclopedic and all inclusive, particular stress being placed on the physiologic basis for the individual's signs and symptoms. A bibliography is included only in the chapter on Symptoms in Psychiatry.

JOSEPH E. SCHENTHAL, M. D.

On the Contributions of Hugh Owen Thomas, Sir Robert Jones, John Ridlon, M. D., to Modern Orthopedic Surgery: By H. Winnett Orr, M. D., (with a Supplement on Ridlon and His Share in Moulding Orthopedic Surgery by Arthur Steindler, M. D.) Springfield, Ill., 1949. Pp. 253 illus. Price, \$4.50.

This is an excellent contribution to the history of orthopedic surgery, written by one who is qualified as few others are as a historian of orthopedic surgery. As the title infers, the discussion centers on the contributions of Thomas, Jones and Ridlon to the present-date concept of orthopedic surgery and contains brief biographical sketches of these three outstanding surgeons, as well as a minute, thorough inspection and analysis of the principles as taught by these three. The author treats much of the material in an extremely personal manner, since he was associated with Dr. Ridlon as a student and close personal friend.

The thorough evaluation of the fundamental principle of rest, the methods of obtaining rest, and the prevention and cure of disability are completely investigated, evaluated, and expounded in this book. There are numerous reproductions of prints taken from Thomas' early works which are no longer available to most of the surgeons of today. These should prove of great value to any student of bone and joint disease, not only because of their historical value but also because of the thoroughness, effectiveness, and simplicity of design which Thomas perfected after extensive experimentation.

Steindler's supplement on Ridlon and his share in molding orthopedic surgery is a sympathetic, critical evaluation of the important part John Ridlon played in establishing the principles of Thomas in this country, together with an evaluation of the outstanding work which Ridlon has done in

hip joint disease and his other numerous contributions in bone and joint lesions.

This book will be of extreme value not only to a student of medical history but to any orthopedic surgeon.

JACK WICKSTROM, M. D.

Clinical Aspects and Treatment of Surgical Infections: By Frank Lamont Meleney, M. D., F. A. C. S. Philadelphia. W. B. Saunders Co., 1949. Pp. 840 pl. illus. Price, \$12.00.

In this 840 page volume Doctor Meleney presents the results of his extended thinking and his painstaking investigations in the field of surgical infections, both from clinical and laboratory standpoints. The subject matter is presented according to the various organs, systems, and regions of the body. There are many references to pertinent contributions which have been made on the subject by other workers. There are many excellent illustrations as well as numerous case histories which support the author's observations and conclusions concerning surgical infections. The sulfonamides, penicillin, streptomycin, bacitracin and other drugs are critically evaluated. Lists of references are given at the end of each chapter and the references are cross-listed in the very complete index to the entire volume.

AMBROSE H. STORCK, M. D.

PUBLICATIONS RECEIVED

F. A. Davis Company, Philadelphia: *Medicine Throughout Antiquity*, by Benjamin Lee Gordon, M. D.

Prentice-Hall, Inc., New York: *Outwitting Your Years*, by Clarence W. Lieb, M. D. *Help Yourself to Better Sight*, by Margaret Darst Corbett.

W. B. Saunders Company, Philadelphia: *Vocabulary Guide, A Teacher's Supplement to The American Nurses' Dictionary*, by Alice L. Price, R. N. *The American Nurses Dictionary*, by Alice L. Price, B. S., R. N. *Clinical Auscultation of the Heart*, by Samuel A. Levine, M. D. and W. Proctor Harvey, M. D. *Care of the Surgical Patient*, Fifth Edition, by Jacob Fine, M. D. *Nutrition and Diet in Health and Disease*, by James S. McLester, M. D.

Charles C. Thomas, Springfield, Illinois: *Surgery of Thyroid Disease*, by Joseph L. DeCourcy, M. D. and Cornelius B. DeCourcy, M. D. *The Technique of Pulmonary Resection*, by Richard H. Overholt, M. D. and Lazaro Langer, M. D. *Practical Lessons in Psychiatry*, by Joseph L. Fetterman, M. D.

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